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Lectures on Practical Mining in Germany.

CLAUSTHAL MINING SCHOOL NOTES—No. XVII.*

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SECTION II.

PROSPECTING FOR MINERALS—BORING.

I.—PRELIMINARY PRECAUTIONS AND ARRANGEMENTS.

Every winding apparatus should be provided with a brake, as not only the fate of the boring but also that of the men if a tread-wheel is used may be dependent upon it. It should be solidly built, and so arranged that the man who has control over it can readily oversee the mouth of the bore hole. When the borings are very deep the brake should not be dependent on manual power, but should be made self-acting. Both kinds, however, should be provided, and made to act on both rims. The arrangement we are describing is provided with a loose brake for manual power. We shall describe a self-acting brake on returning to a description of the bore tower. The brake consists of a horizontal beam, to which two brake blocks are attached, the balk rests with one end loose between the two uprights, and the other end rests against the other two uprights, which must be firmly fixed, as it forms the fulcrum for the lever. When the brake is to be applied it is done by pulling the lever in the direction towards the bore hole. Of course, this is not recommended as the best arrangement, a self-acting brake is always to be preferred. Brakes which act by means of screws, or other gradual appliances, should be discarded, as one should always be able to apply the brake instantaneously. Double brakes, which act on two opposite sides, give a better result, and can be made to act more promptly.

The winding rope is round, of best hemp, and from ¾ in. to 1¼ in. in diameter, according to the weight to be raised; its length depends upon the distance between the bore shaft scaffolding and the winding pulley. The rope when let out being attached to the boring-rods at the level of the upper scaffolding, should be coiled at least about twice round the winding axle, to prevent the wearing of the rope where it is attached to the axle. When the boring is to be above 50 fms. a flat rope should be used from 5 in. to 6 in. broad, and ¾ in. to 1¼ in. thick. Flat ropes are always to be preferred; those made from Manilla hemp last extremely well, even when dry. Every rope should be well tarred, the strands being drawn first singly through the tar cask. When the rope becomes dry during use it should be well smeared with tallow or soap. It is advisable to cover that part of the axle on which the rope coils with laths of beech wood, in order to protect the axle, the wearing away of any part can then be readily repaired.

The end of the winding rope must be provided with a swivel, so that when turning the rods round to screw or unscrew them the rope will not be twisted. This must be made strong enough for its purpose, and so arranged that if the rope breaks the rods will not fall to the bottom of the bore hole, the swivel being caught by the top of the guiding bore tube.

Construction of the swivel joint.—The rope is bent round a sheet-iron neck or dished ring, and then carried double for a length of 18 to 24 inches. A few nails are sometimes driven through the two portions of the rope at this place, and it is afterwards bound fast by band, or string, or wire. The ring of the swivel is enlarged at its lower end, which has a circular hole bored through it, through which the top of the swivel rod passes, this has then a cotter ring passed over it, and a nut screwed tight on to the end, the nut is prevented from unscrewing by means of a split pin passing through it and the top of the swivel rod. At about the middle of its length the swivel rod has two cross arms welded to it. The lower end of the rod swells out, and has a hole bored in it, which is tapped, and into which the top of the boring-rod screws. Another arrangement of the swivel for a round rope differs only from the former in that the enlarged middle part of the swivel-rod has a hole bored through it, through which a cross-bar can be passed, instead of having the cross-arms welded. The arrangement of a swivel for a flat rope consists of an iron stirrup, provided at the lower end with holes, through which a short pin passes, being fixed at each end by nuts. The rest of the arrangements, except the fastening of the rope, is similar to the one we have just described.

Glenck and Kind have used swivels differing somewhat from the ones we have just described. The lower ring is made of considerable breadth, to serve the purpose of the cross-arm in the previous arrangements. The nut to which the rods are screwed is open at the top, and possesses the advantage that the borer master can readily see if the rods are properly screwed on to the ring. This nut should be formed of unhardened steel, not to damage the screw on the top of the boring-rods. The width of the ring depends on what sort of rope is used. In many cases the so-called ox-foot is used as an auxiliary tool. The forked end is slipped below the swelling on the boring-rods, which are prevented from slipping out by a pin. This generally requires a special rope, which is hung from the beams of the bore tower over the bore shaft.

Boring Tower after Kind's Construction.—We shall now proceed to describe a boring tower used in the boring trials near Brandeisel, and constructed after Kind's arrangement. The erection of a bore tower should take place after the whole of the framing has been prepared for putting together. The erection of the two broader sides must be completed in one day; previous to their erection the ground framework, consisting of the long beams and two shorter cross beams, must be placed in position over the bore shaft, and firmly fixed by strong wooden wedges driven into the ground. The two broad upright frames (with the cross diagonals and struts complete) are laid over each other so that the tenon at the foot of each of the four corner legs is exactly over the corresponding mortise in the ground frame. At a short distance, and parallel to one of the longer sides, two long poles (12 yards or more), about 18 ft. apart, are fixed upright in the ground, the lower end being sunk 3 or 4 ft., and tightly wedged. A pulley is fixed to the upper end of the poles; lastly, and some distance from each of the poles, and on the opposite side to the bore-hole, a windlass or winch is fixed, round which a rope, attached to one of the legs, and passing over the pulley is coiled. The side frame nearest the upright poles is the first raised by turning the windlass gradually, part of the strain being taken off the ropes by props, which some of the workmen bring under the frame. Another set of workmen guide the tenon into the mortise in the ground frame. When the side is raised in proper position the windlass is chocked tight, and the frame is surrounded with props.

The second side frame is raised in a similar manner, only that in order to prevent it overturning (since these side frames are slightly inclined inwards towards each other) it must be pulled by an additional rope in the opposite direction to that going to the windlass. When both side frames are raised two carpenters climb to the top of the frames (by driving climbing irons or pins into one of the corner legs) and fix the cross strut joining the top of the frames in its place. The strut may either be hauled up by ropes, or attached to the frames before raising. After this and the cap pieces have been fixed in their place the legs are tied with diagonals, and horizontally strutted in the two shorter sides beginning below. When the shorter sides of the bore tower are finished stagings and ladders are fixed in their places. After this the beams on which the winding pulley is to be fixed are laid down, and the remainder of the details are completed. Afterwards the whole of the tower is covered outside with planking. On one of the longer sides opposite the bore hole a high narrow slit or door is left in the framework, by which the long rods, tubes, &c., are introduced. For ordinary purposes the bore tower is provided with another door, and windows must be fixed as the tower is being covered with planking. The winding apparatus only is somewhat different from what we have described in the use of a boring triangle or three legs. Here there are two flat ropes provided, which are so arranged that when the loose end of the one is raised to its highest point ready for unscrewing one or one set of the rods the other hangs at the lowest point in the shaft ready for attaching to the next, so that no time is lost in lowering the one or other of the ropes. Since each rope is flat, and must be coiled upon itself, two special pulleys and drums are fixed on the winding axle, having two discs of wood on the sides to prevent the ropes slipping. The two winding pulleys are fixed side by side, instead of above each other, but this arrangement answers quite as well when the tower is of considerable height as in the present case. The brake is self-acting, inasmuch that the lever is of a tolerable length, and its weight is sufficient to call the brake into play; when it is required to apply the brake more strongly this can be done by pressing the foot on the end of the lever (*i.e.*, downwards). When it is required to slacken the brake this can be done by lifting the end of the lever.

Before leaving this part of our subject—the bore tower or frame, the following remarks on the dimensions of the bore tower will be best inserted here. The bore tower seldom exceeds 100 ft. in height, and is generally less. With shaft rods 40 ft. in length, when there is also a bore shaft, the height is usually about 80 ft., so that at least two rods can be unscrewed at once. In the boring trials at Schöningen the bore tower was 87 ft. high; two rods each 40 ft. 6 in. long were screwed on or off at once. The base of the tower was 45 ft. by 30 ft. At Lütgeneder the bore tower was 57 ft. high and square in horizontal section, the base being 24 ft. square, and the top 12 ft. 6 in. square. A top story which had vertical sides made the total height of the bore tower 68 ft. 6 in. The rods were not reared against the side of the bore tower but hung free from a rack. At Elmen the tower was made 20 ft. higher than the length of a set of rods. It will be found advantageous and necessary to have scaffoldings at different heights in the bore tower.

3. Arrangement for raising the sludger, &c.—This consists usually of a hand windlass or winch. In the arrangement for the previously described boring triangle an ordinary hand windlass is used, its supports being fitted into the framework of the boring lever, and strutted on both sides. The axle is about 10 in. in diameter, and the handles 18 in. from the centre of the axle, and so arranged that two men can work at each handle. The rope, which is round, is ¾ in. in diameter, and must be well tarred, as it has to descend into the bore hole, which is filled with water. The windlass is also provided with a break, which acts by its own weight. The rope passes over a pulley attached to the frame of the scaffolding on which the workmen stand to screw or unscrew the rope swivel to the top of the rods, and must be so arranged that it can be readily placed over the bore hole or removed from it. With deep bore holes it is advisable to use a ½-inch round wire-rope, since an hempen rope is not so strong, and liable to become damaged by the freezing of the water in winter, the rope being nearly always wet from passing up and down in the water in the bore hole. The windlass arrangement used by Herr Beer, at Brandeisl, consists of a windlass provided with spur gearing. The diameter of the drum is 3 feet. The brake is double, and self-acting. The number of teeth on the pinion is to the number of teeth on the wheel as one to four. A wire-rope requires a greater diameter of the axle or drum than an hempen one, and for the former the diameter should not be less than 2 ft. As the pulley round which the rope from the windlass used for raising the sludger passes only requires to have one edge vertically above the borer hole whilst the sludger is being raised or lowered, and during the rest of the time must be placed sideways, the following arrangement was used by Herr Beer in the borings at Brandeisel, the bore tower being after Kind's construction. The pulley, which is 3 ft. in diameter, is fixed between the two sides of a long fork. At the upper end of the fork the lower (inner side) is made convex, and this fits into a concave portion on the upper side of a cross beam, so that the fork and pulley can swing as a pendulum in the plane of the disc of the pulley. In its ordinary vertical position the pulley lies sidewards from the boring hole; when it is required to bring the rope in the axis of the bore hole the fork is pushed forward into position, the lower part of the fork being fixed tight by wedges which fit into grooves cut in lower frame.

4. The Smithy.—Since boring trials are often made at some distance from the already working portion of a mining district, and often at a considerable distance from the nearest village or town, it is always advisable, if not necessary, to have a smithy in connection with the boring house. Even if there is a smithy in the neighbourhood, still it will be better to have a special one in connection with the boring, since the work will be well done and better by those who know the necessity of exact and straight workmanship, and one will always be able to get the work done at once. A wooden structure with a brick hearth and sheet-iron cover and a chimney will suffice, and should be roomy enough to contain, besides anvil block and other smithy tools, a work table for the adjustment of the rods, &c. The coke and iron necessary can be placed under a special roof outside. In procuring iron, steel, &c., care should be taken to have it of the best quality. It will be only necessary to engage one smith—one of the borers would be able to do the striking work. The smith should not be engaged on piece work, but paid by the week or month, so as to ensure the best workmanship, and he should have the best opportunity of seeing the boring as it proceeds, for when he has an intelligent appreciation of what is required he will be better able to make the necessary and most suitable adjustments and arrangements.

We now come to the second part of this subject—

II.—THE CONSIDERATION AND DESCRIPTION OF THE SEPARATE BORING TOOLS.

Like every other borer, the earth borer consists of a straight rigid rod at the upper end of which the power is applied, the lower end being supplied with a sharp edge with which the boring is effected. As it is often the intention to bore several hundred feet deep in the earth's crust the borer must in some cases be extremely long, and of a strength corresponding to the hardness of the rock to be bored through. It is impossible to mak it all in one piece, nor could it be handled if made so; the lower part often requires repairing, and the upper part must be arranged for attaching to the end of the lever. In consequence of this we shall consider the boring apparatus as consisting of:—

(*a*). The head or top-piece, to which the force is applied—*i.e.*, to raise and allow it to fall.

(*b*). The shaft rods by means of which the apparatus can be lengthened or shortened to suit the varying depth of the bore hole.

(*c*). The borer proper acts directly upon the rock; and lastly,

(*d*). Other necessary and auxiliary appliances.

Let us imagine the bore apparatus arranged and fixed so as to form a rigid heavy borer which is attached to the end of the bore-lever, so that it hangs free in the bore hole, and that an up and downward movement is imparted to it; it will be readily imagined that every blow will break off parts of the rock at the bottom of the bore hole, where a deepening will take place. It will be evident that without guides the hole would not be regular, but when the borer is passed down through the guides and guide boring-tube that the borer will always strike the ground in a certain position, and if, moreover, the borer is gradually rotated we shall have a straight round hole. If the up and down movement of the bore-lever be continued for some time the bore hole will become gradually deeper, and a considerable amount of fine powder and debris will be formed at the bottom of the hole, the end of the borer will at last not reach to the bottom of the hole, and if it does so there may be so much debris that the blow of the borer will fall upon it and be checked, pounding it to powder instead of cutting deeper. Hence the debris at the bottom of the bore hole must be removed, and the borer before being again introduced must be lengthened; this lengthening of the rods is chiefly effected in the shaft part, the top and the borer itself remaining unchanged. By this lengthening the rods become heavier and heavier, and although they can be raised and lowered by muscular power still the blows tell so forcibly on the rods themselves that they may from this cause become readily broken. This is especially the case from the fact that however good may have been the quality of the iron and steel from which they are made, the constant vibrations will induce a crystalline structure. From this it will be evident that for very deep borings a long rigid set of rods is inadmissable in consequence of the great number of breakages and stoppages which would thus occur.

In 1826 and 1827 two letters appeared written by the French missionary, Abbe Imbert, descriptive of boring by the aid of a rope as carried on by the Chinese, who were said to have carried holes of 4 to 6 in. diameter for springs to a depth of from 1000 to 3000 ft. in the Canton Ong-Tong-Kiáo. The first attempt to introduce and apply this method in Europe were unsuccesstul, and may be said to have remained so till the invention of Messrs. Mather and Platt's rope-borer. Attention was, therefore, directed to the separating of the borer proper from the shaft rods in such a manner that the former was raised to a certain height by the rods and afterwards allowed to fall by itself without the rods having to acquire the same velocity. This method possessed also the advantage that the rods were not subjected to the side movement so injurious to the sides of the bore hole, and that by means of a counterbalance the weight of the rods could not be entirely obviated. From this we see that a boring apparatus besides consisting of the three parts (head, shaft-rods, and borer) may have a fourth—a free falling piece, the whole apparatus being called a free-falling borer.

We have, therefore, three principal methods by which boring is effected:—

1.—With rigid rods, the oldest European method.

2.—With a free-falling apparatus.

3.—With a rope, or rope boring.

A—*The Top-piece or Head of the Borer.*—The head of the bore apparatus consists of a swivel similar to that we have described for the winding-rope above. The nuts formed at the end screws on to the top of the boring-rods, and a strong chain is passed through the ring by which it is attached to the end of the lever. By this arrangement the rods are attached to the end of the lever, and can be raised or allowed to fall, whilst by means of a round piece of wood passed through a hole in the head, thus forming a cross bar or handle, the boring-rods can be gradually rotated. Many swivels have an additional hole at right angles to the first, but an extra one is quite unnecessary. With the exception of the lower part which forms the nut the swivel is round, the nut being square. The chain is an ordinary one, with oval links, of corresponding strength to the weight of the rods, generally one-third the size of the rods, and is made out of the best soft iron. The end of the chain is provided with a strong hook. The chain is drawn through the ring of the swivel, and the hook is passed through one of the links. The other end of the chain, or rather the middle of the chain, is attached to the lever by passing one of the links over the hook fixed to the lever; the remaining loose end of the chain is hung from a nail driven into the lever. As the bore hole becomes deeper the chain is lengthened, link by link, either at the swivel or at the lever, until this will not reach any longer, when an additional rod must be screwed on.

In 1842 Kind replaced the use of the chain by that of a lengthening screw, which has the advantage that the connection is more rigid, and the lengthening can be constantly, more gradually, and more quickly and easily effected without the disagreeable rattle of the chain.

At present the lengthening screw is almost universally used, and forms for itself the head piece of the boring apparatus. It consists of a screw, two side links, and a swivel. The screw has V-shaped threads (though square threads may be equally well used), the pitch being 2 to 2½ threads per inch. The screw is 2 ft. long, 1½ in. in diameter, the upper end being formed into a round spindle, with an eye through which a very short chain passes, by which it is attached to the hook on the rocking lever. The nut into which the screw passes is 2 in. deep and 2½ in. broad, and is turned where it passes through the eyes in the links, being fastened on both sides with a nut. At the lower part is a very similar arrangement, forming a swivel, only that in place of the nut there is a round opening, through which the swivel-rod passes. The lower end of the swivel-rod is formed as usual into a nut, which screws on to the top of the shaft-rods. The weight of such a lengthening screw is about 100 lbs. In order to prevent the rotation of the screw in the nuts a small thumb screw is inserted through to one of the side links. When it is required to lengthen the rods the binding screw is unloosed, and the links, and with them the nuts, are turned from left to right, and the binding screw is again made tight. The arrangement we have just described is that used by Herr Beer, at Brandeisl; the original one by Kind differs only in that the upper end of the screw is attached at once, by means of a pin and socket-joint, to the lever head, and that the lower portion of the links, which are welded together, terminate in an eye-piece. The swivel connecting the rods with the lengthening screw is made in the form of a stirrup. This arrangement is somewhat steadier than that of Beer, but is more difficult to repair.

* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergrath Dr. VON GRODDECK, Director of the Royal Bergakademie, Clausthal, The Harz, North Germany.

THE IRON AND STEEL INSTITUTE.

The eighth annual meeting of this Institute has been held during the week at the house of the Institution of Civil Engineers (by permission of the council of that body), Great George-street, Westminster. On Tuesday the business was of the usual routine character, and consisted chiefly in receiving and adopting the report and balance sheet,— Mr. W. MENELAUS occupied the chair.

The report stated that the total number of members elected during the year was 69, making a total on the books of 946. At the meeting in Leeds particular attention was called to the advisability of taking some action for procuring a distribution of a portion of the property held by the Royal Commissioners of the Exhibition of 1851 for the purpose of promoting technical education in the more important of our manufacturing districts. The council were requested to use their influence in giving effect to the resolution of the general meeting. Since that time the council had placed themselves in communication with various science colleges and technical institutions throughout the country, and they have made arrangements to hold a preliminary conference between the representatives of those various bodies with a view of determining upon the course of action that it will be most advisable to pursue in connection with this matter. It was stated that the council had awarded the Bessemer medal for this year to Dr. John Percy, of the Royal School of Mines. It was with deep regret the council had to announce the death of the late foreign secretary, Mr. David Forbes, in December last. Mainly through Mr. Forbes' exertions the Institute was at an early date placed in direct communication with all the leading continental metallurgists. The chairman moved the adoption of the report which was seconded by Mr. E. A. Cowper, and carried unanimously. The scrutineers announced that all the gentlemen nominated as members had been elected. It was announced that the next autumnal meeting of the Institute would be held at Newcastle-on-Tyne. A cordial vote of thanks was given to the Chairman, in acknowledging which he congratulated the members on the most satisfactory progress which the Institute was making.

The meeting was resumed on Wednesday morning, when the President stated that in order to save time they had disposed of the routine business on the previous day, when 26 new members were elected, and a number of names were passed, which he hoped would be added to their list. The Council had accepted the report, and presented the balance-sheet, which he hoped would be considered satisfactory. They were not rich, but what honourable man connected with the iron and steel trade is rich in these times? so that the Institute could scarcely expect to be so. He was unable to state that the Institute had 1000 members, but they had so nearly reached that number that he hoped that Dr. Siemens before his term of office had expired would be able to announce that they had 1000, or more than that number. He referred to the great value of the papers read, and remarked that the discussion which followed was no less useful; indeed it was worthy of the papers. They had suffered a great, and what they had at first believed to be an irreparable, loss in the death of Mr. Forbes, but Mr. Deby had been appointed foreign secretary, and he did not doubt that he would be found a worthy successor. Owing to the death of Mr. Forbes they had been deprived of the pleasure of a visit to Sweden, but he hoped that this might be arranged on some future occasion. No commission had been ap-

pointed by the Institute to visit the Philadelphia Exhibition, but ey would presently have an opportunity of looking at that exhi-tion through the spectacles of Mr. I. Lowthian Bell, which to some f them would be even more advantageous than going themselves. e concluded by congratulating them on the appointment of his ccessor, Dr. Siemens, and thanking them for the kind manner in hich they had treated him whilst he had been in office as Presi-ent; indeed their kindness would have made him regret leaving e chair but for the knowledge of the great ability of his successor.

Mr. C. W. SIEMENS, LL.D., F.R.S., took the chair.

The PRESIDENT's inaugural address stated that the Duke of Devon-hire, as its first President, pointed out to the young society the useful esults that would be realised through a judicious combination of atural science with practical experience, and by attention to the rogress in metallurgical processes effected in other countries. He as implanted upon this Institute a vitality which has resulted in apid increase of its members, and a career of usefulness such as arcely any other society for the promotion of applied science can oast of. Intimately connected with the interest of the Institution, nd with the prosperity of the iron trade, is the subject of techni-al education. It is not many years since practical knowledge was egarded as the one thing requisite in an iron smelter, whilst theo-etical knowledge of the chemical and mechanical principles in-olved in the operations was viewed with considerable suspicion. he aversion to scientific reasoning upon metallurgical processes ex-tended even to the authors who professed to enlighten us upon these ubjects; and we find, in technological works of the early part of he present century little more than eye-witness accounts of the rocesses pursued by the operating smelter, and no attempt recon-ile those operations with scientific facts. A great step in advance as made in this country by Dr. Percy, when in 1864 he published is "Metallurgy of Iron and Steel." On the Continent of Europe he researches of Ebelmann, and the technological writings of Karsten, Tunner, Gruner, Karl, Akermann, and others have also con-tributed largely towards a more rational conception of the processes employed in iron smelting. The nations of the Continent of Europe were the first to recognise the necessity of technical education, and it has been chiefly in consequence of their increasing competition with the producers of this country that the attention of the latter has been forcibly drawn to this subject.

The only special educational establishment for the metallurgist of Great Britain is the School of Mines, which has already produced most excellent results in furnishing young metallurgists, it is still susceptible of great improvement, by adding to the branches of knowledge now taught at Jermyn-street, and it is a step in the wrong direction to separate geographically and administratively the instruction in pure chemistry from that in applied chemistry, geology, and mineralogy. If properly supported the School of Mines might become one of the best and largest institutions of its kind, but it would be an error to suppose that, however successful it might be, it could be made to suffice for the requirements of the whole country. Other similar institutions will have to be opened in provincial centres, and we have an excellent example set us by the City of Manchester which, in creating the Owens College, has laid the foundation for a technical university, capable of imparting useful knowledge to the technologist of the future.

Technical education is here spoken of in contradistinction to the purely classic and scientific education of the Universities, but he would not advocate any attempt at comprising in its curriculum a practical working of the processes which the student would have to direct in after life. This had been attempted at many of the poly-technic schools of the Continent, with results decidedly unfavourable to the useful career of the student. The practice taught in such establishments is devoid of the commercial element, and must of necessity be an objectionable practice, engendering conceit in the mind of the student which will stand in the way of the unbiassed application of his mind to real work. Let technical schools confine themselves to the teaching of those natural sciences which bear upon practice, but let practice itself be taught in the workshop and in the metallurgical works.

After briefly referring to the questions of labour and commercial depression, he remarked that next in importance to cheap—or, rather, efficacious—labour in the production of iron and steel comes cheap fuel. Fuel, he said, in the widest acceptation of the word, may be said to comprise all potential force which we may call into requisition for effecting our purposes of heating and working the materials with which we have to deal, although in a more restricted sense it comprises only those carbonaceous matters which in their combustion yield the heat necessary for working our furnaces and for raising steam in our boilers. According to the report of the Coal Commissioners, published in 1871, there were then 90,207 mil-lion tons of coal available in Great Britain at depths not greater than 4000 ft. and in seams not less than 1 ft. thick, besides a quan-tity of concealed coal estimated at 56,273 millions of tons, making a total of 146,480 millions. Since that period there have been raised 600 millions of tons up to the close of 1875, leaving 145,880 millions of tons, which, at the present rate of consumption of nearly 132 mil-lions of tons annually, would last 1100 years. Statistics show that during the last 20 years there has been a mean annual increase in output of about 3½ millions of tons, and a calculation made at this rate of increase would give 250 years as the life of our coal fields. In comparing, however, the above rate of increase with that of population and manufactures, it will be found that the additional coal consumption has not nearly kept pace with the increased de-mand for the effects of heat, the difference being ascribable to the introduction of economical processes in the application of fuel. In the case of the production of power, the economy effected within the last 20 years exceeds 50 per cent., and a still greater saving has probably been realised in the production of iron and steel within the same period, as may be gathered from the fact that a ton of steel rails can now be produced from the ore with an expenditure not exceeding 50 cwts. of raw coal, whereas a ton of iron rails 20 years ago involved an expenditure exceeding 100 cwts. Ac-cording to Dr. Percy, one large works consumed in 1859 from 5 to 6 tons of coal per ton of rails. Statistics are unfortunately wanting to guide us respecting these important questions. Considering the large margin for further improvement regarding almost every ap-plication of fuel which can be shown upon theoretical grounds to exist, it seems not unreasonable to conclude that the ratio of increase of population and of output of manufactured goods will be nearly balanced for many years to come by the further introduction of economical processes, and that our annual production of coal will remain substantially the same within that period, which, under those circumstances, will probably be a period of comparatively cheap coal. The resources of some of the chief coal fields of the world, the chief lignite and peat deposits, and the utilisation of the Falls of Niagara, which alone is capable of furnishing 16,800,000-horse power per annum, or the equivalent of the expenditure of 265,000,000 tons of coal, or as much as is annually raised throughout the world, were in turn referred to, and, as an improvement upon existing methods of transmitting power long distances at present in use, Dr. Siemens proposes to make Niagara work a large dynamo-electric machine, the electricity being sent through enormous me-tallic conductors to the various centres of industry requiring motive-power.

Turning to the question of the processes for converting crude iron ore into such materials as leave our smelting works and forges, he remarked that although iron and steel were known to the ancients and referred to in their works, we have no account of the pro-cesses employed in their manufacture until, comparatively speaking, recent times. Aristotle describes steel as purified iron, and says that it is obtained by re-melting iron several times, and treating it with various fluxes; we are hence led to suppose that in Aristotle's time steel was made by careful selection, and treatment of steely iron, which latter was produced by something analogous to the Ca-talan process. A method referred to by ancient author is to bury iron in damp ground for some time, and then to heat and hammer it. Another process described first in Biringuccio's "Pyrotechno-logy," one of the earliest works on metallurgy, and later in Agricola's "De Re Metallica," both published in the 16th century, is to retain malleable iron for some hours in a bath of fused cast-iron, when it becomes converted into steel. Reaumur, in 1722, produced steel by melting three parts of cast-iron with one part of wrought-iron (pro-bably in a small crucible) in a common forge, but he failed to pro-duce steel in this manner upon a working scale. A similar method of producing steel to that proposed by Reaumur has been employed in India for ages, the celebrated Wootz steel, being the result of partial or entire fusion of steely iron and carbonaceous matter in small crucibles arranged in a primitive air-furnace followed by a lengthy exposure of the ingots to heated air in order to effect a partial decarburisation. The labours of Hasenfratz, Heath, and Huntsman were noticed, and the importance of the Bessemer pro-cess pointed out, full credit being given to Mr. A. L. Holley for his exertions in America, and attention directed to the Siemens-Martin or open-hearth process. The increased facilities offered for the manufacture of steel by the use of ferro-manganese introduced by Mr. Henderson in 1868; Mushet's tungsten steel and the chromium steel were referred to, and Dr. Siemens then suggested that the formation of steely compounds in connection with the future deve-lopments of the application of steel might be much advanced by an organised research under the auspices of a committee of the Iron and Steel Institute. He observed that the value of the material known as mild steel or ingot metal, consists in its extreme ductility under all possible conditions. Its ultimate strength is much in-ferior to that of ordinary steel, and rarely exceeds 28 tons per square inch; its limit of elasticity is reached at 15 tons per square inch, whilst the limit of elasticity of a harder steel may reach from 25 to 30 tons per square inch, and that of hard drawn steel wire from 45 to 50 tons. But in estimating the relative value of these different materials by the amount of work that has to be expended in caus-ing rupture, it will be found that the mild steel has the advantage over its competitors. When subjected to blows or sudden strains, such as are produced by the explosion of guncotton or dynamite, extra mild steel differs in its behaviour from that of BB iron and ordinary steel, by yielding to an extraordinary extent without frac-turing, and it is in consequence of this non-ability to rupture that it may be loaded to a point much nearer to its limit of elasticity than would be safe with any other material.

The applications of steel, the efforts made in connection with me-chanical puddling, and the production of iron and steel direct from the ore having been noticed, reference was made to the question of nomenclature for iron and steel products, which is now becoming of great practical importance, when rules are to be laid down regu-lating the permissible strength of the different grades of these ma-terials. Dr. Percy has defined steel as iron containing a small per-centage of carbon, the alloy having the property of taking a temper, and this definition is substantially equivalent to those found in the works of Karsten, Wedding, Grüner, and Tunner; on the other hand, Messrs. Jordan, Greiner, Gautier, Phillipart, Holley, and others define as steel all alloys of iron which have been cast in mal-leable masses, whilst Sir Joseph Whitworth considers that steel should be defined mechanically by a co-efficient representing the sum of its strength and ductility. With the object of settling this question of nomenclature an International Committee was appointed at Philadelphia by the Institution of American Mining Engineers. The Committee consisted of the following gentlemen:—Mr. Isaac Lowthian Bell, M.P.; Dr. Hermann Wedding; Professor Tunner; Professor Akermann; M. Grüner; and Messrs. A. L. Holley and T. Egleston, and they resolved that the following should be recom-mended:—

"I. That all malleable compounds of iron, with its ordinary ingredients, which are aggregated from pasty masses, or from piles, or from any form of iron not in a fluid state, and which will not sensibly harden and temper, and which generally resemble what is called wrought iron, shall be called weld iron (German, Schweiss-eisen; French, Fer soude).—II. That such compounds when they will from any cause harden and temper, and which resemble what is now called 'puddled steel,' shall be called weld steel (German, Schweiss stahl; French, Acier soude).—III. That all compounds of iron, with its ordinary ingredients, which have been cast from a fluid state into malleable masses, and which will not sensibly harden by being quenched in water while at a red heat, shall be called ingot iron (German, Fluss-eisen; French, Fer fondu).—IV. That all such compounds, when they shall from any cause so harden, shall be called ingot steel (German, Fluss-stahl; French, Acier fondu)."

The nomenclature here proposed is entitled to careful considera-tion from the eminence for both theoretical and practical knowledge of the gentlemen composing the committee, but Dr. Siemens appre-hends that for common use the distinctions desired to be drawn are too manifold. Moreover, the lines of demarcation laid down run through materials very similar, if not identical, in their application where a distinction in name would be extremely difficult to main-tain and awkward to draw.

One of the drawbacks to the use of iron and steel for structural purposes is found in their liability to rust when exposed to heat and moisture. Galvanising is not applicable in those cases in which structures of iron and steel are put together by the aid of heat, or are brought into contact with sea water, which would soon dis-solve the protecting zinc covering. But even in these cases the metal may be effectually protected against corrosion by attaching to it pieces of zinc, which latter are found to dissolve in lieu of the iron, and must, therefore, be renewed from time to time. Captain Ainslie, of the Admiralty, has lately made a series of valuable ex-periments, showing the relative tendency towards corrosion of both iron and steel when in contact with sea water, and of the efficacy of pieces of zinc in preventing this corrosion. These experiments further show that mild steel is—contrary to the results obtained by M. Gautier—more liable to corrosion than wrought-iron in its un-protected condition, but that zinc acts most efficaciously in protect-ing it. Quite recently another mode of protecting iron and steel plates from corrosion has been suggested by Prof. Barff. This con-sists in exposing the metallic surfaces, while heated to redness, to the action of superheated steam, thus producing upon their surfaces the magnetic oxide of iron, which, unlike common rust, possesses the characteristic of permanency, and adheres closely to the metallic surface below. In this respect it is analogous to zinc oxide adher-to and protecting metallic zinc, with this further advantage in its favour, that the magnetic oxide is practically insoluble in sea water and other weak saline solutions.

In conclusion, and with a view to provide house accommodation for the Institute, which at present has not the means of acting in-dependently, Dr. Siemens suggested that it might be possible for the Institute to join efforts with those kindred institutions for the erection of a joint building, representing Applied Science of the country as completely as Burlington House represents pure science. Such a project could not be realised without the concurrence of the parent institution of applied science—the Institution of Civil En-gineers—whose building, though large, is by no means sufficient for its actual requirements. The new building might, therefore, ac-commodate the Institution of Civil Engineers, the Institution of Mechanical Engineers, the Institution of Naval Architects, the So-ciety of Telegraphic Engineers, the Iron and Steel Institute, and possibly other societies which hold their ordinary meetings on dif-ferent days of the week, and some of them at considerable intervals of time; it would not, therefore, be necessary to provide more than one, or perhaps two, general meeting rooms, and one library, but each society would require separate office accommodation and council chambers, the whole being so arranged as to be able to be thrown open for the holding of *conversazioni*. The common interest of the societies might be placed under the supervision of a joint house and library committee, presided over by by the President of the Insti-tution of Civil Engineers, and comprising among its members one or two members of councils and the secretaries of the different so-cieties. The Government would, probably, not be unwilling to fur-ther the realisation of an object of such great usefulness by grant-ing a site in the central portion of the metropolis. Each society might be called upon to furnish a portion of the capital required, either out of its accumulated funds, or by voluntary contributions of its members, and the remainder could, probably, be raised upon debentures, and thus become chargable upon the ordinary subscrip-tions of future years.

Lord FREDERICK CAVENDISH proposed, and Mr. HENRY BES-SEMER seconded, the vote of thanks to the President for his address, and the motion having been supported by Mr. G. T. CLARK, and put to the meeting, was unanimously carried.

The PRESIDENT having acknowledged the compliment, said that the first duty which devolved upon him was one which gave him great satisfaction—to present the Bessemer Medal to Dr. Percy. Metallurgists had for many years past been accustomed to look upon Dr. Percy's book as the standard work upon the subject; it seemed, therefore, almost arrogance on their part to offer an award to their teacher, as they could not add to his reputation as a metallurgical author, which extended not only to Europe but to the whole civilised world. But perhaps they were the most reliable judges of the value of his labours, and he hoped, therefore, that he would receive it as a mark of their appreciation of his success in securing the applica-tion of scientific knowledge to metallurgical processes. To himself it afforded the greatest satisfaction to have to present the medal to Dr. Percy.

Dr. PERCY expressed his high appreciation of the award, and said that to him there could be no honour more coveted, for he should look upon the medal as the material expression of their approval of his labours, and he considered the approval of one's fellows was the highest honour to which one could aspire. With regard to his book which had been so kindly spoken of, no one could be more conscious of its shortcomings than himself, but he hoped shortly to be able to present them with a work more worthy of their acceptance. For the production of his book no one was more indebted to the iron-masters and to his old students than himself. Iron, however, was, unfortunately, not the only metal which engaged his attention, or there would have been no cause for the delay that had occurred in the publication of the new edition. He had been much engaged on the metallurgy of silver, which had given him more trouble than any of the preceding ones. The President had alluded to the School of Mines, and spoken of the desirability of having other technical institutions in great local centres. No one could be more in favour of that view than himself, and he believed independent institutions would be far more valuable. It was at the works themselves that they must expect results, for many problems could only be satis-factorily investigated at the works. He was gratified to see that some of his old students were doing so much for metallurgy, and would only again thank them for the most distinguished honour they hand conferred upon him.

SOLID STEEL CASTINGS.

Mr. F. GAUTIER, of Paris, in a paper on this subject said that when steel is cast in an iron ingot mould, or mould of any kind, cavities of a more or less rounded shape are usually seen inside, apparently caused by gas escaping from the mass. Mr. Henry Bessemer, the first among the metallurgists, has demonstrated that these blow-holes were filled with oxide of carbon, and this view has since been entirely confirmed. When these blow-holes are altogether inside, and do not burst through the crust, they remain silvery white; it is a simple solution of continuity, and to get rid of them it is sufficient to weld the metallic parts by re-heating and the use of a hammer or rolls. What becomes of the carbonic oxide? It is re incorporated with the metal. This has not been determined yet. But the fact is that when rolled steel bars, drawn from honey-combed ingots, are broken no trace is found of this kind of de-fect. When the blow-holes communicate with the outside, and the sides of the ingots are pierced with small holes, well known to the steel manufacturers, the colour is no longer a silvery white; they assume more or less the colours of the rainbow, and even become black. Hammering and rolling do not entirely elimi-nate these blow-holes, as a perfect welding of the metallic particles is prevented by the presence of oxide of iron. There remain some black streaks, which sometimes penetrate to a depth of 1-10th in. (2 millim). In order to correct these surface de-fects, the welding must be done by allowing the piece to undergo heating at as high a temperature as possible; the steel is then covered with sand, and ham-mered vigorously. The oxide of iron which prevented welding is combined with silica, and forms a silicate which pressure easily expels. This is a general practice in the manufacture of fine steels. It will be seen that it is an easy matter to re-move blow-holes when the steel has to undergoe mechanical elaboration; but it is not so with castings. Generally, the more steel is carbonised the better it will flow while casting, and fewer blow-holes will form. On the contrary, the more a steel is decarbonised, the less fluid it will be, and more blow-holes will form. It is probable that hard steel keeps better the oxide of carbon in dissolution, or else it escapes more freely on account of the greater fluidity of the metal.

The Germans have long manufactured steel without blow holes. Everyone will remember those splendid ingots, clean fractured, growing in weight at each suc-cessive exhibition, first beginning, with 2 tons, and finally reaching 45. The Krupp ingots, the cast wheels and bells of Bochum, certainly astonished the me-tallurgical world for some time. The process of manufacture was kept a most pro-found secret, and has not yet been published. More than six years ago the Terre-noire Steelworks found out, by reasoning rather than by practice, the process of the German works, and the improvements they have made have radically trans-formed the result. It seems well proven now that the German products, without blow-holes, are obtained by an addition of a very siliceous pig just before casting; and thus they are found to be highly carburised, and the chemical analysis shows a rather considerabe portion of silicon. To find an explanation of the result, we must go back to the theory of the Bessemer process. It is well known that the combustion of the silicon takes place during the first part of the operation; there is no flame, or rather, there is a series of brilliant sparks; the yellow sodium band, characteristic of all flames, is not seen; no oxide of carbon is formed while there remains any silicon to be oxidised; the silicon decomposes the oxide of car-bon, or, which is the same, prevents it from forming; therefore, if blow-holes are filled with oxide of carbon, they will be made to disappear by the addition of silicon. The carbon is deposited and dissolved in the steel, and silica is formed. Experience shows that steels treated in this manner are generally without blow-holes.

At the Terre Noire Steelworks the manufacture of steel without blow-holes has been perfected by using a silicide of manganese and iron, which gives to the pro-duct remarkable qualities. The silicon prevents blow-holes by decomposing the oxide of carbon, which is in dissolution, and tends to escape during solidification. The manganese reduces the oxide of iron, and prevents a further production of gases by the reaction of the oxide on the carbon. We have seen above that in the decomposition of oxide of carbon by silicon silica was produced, and afterwards a silicate of iron, which remained interposed within the steel. The manganese allows the formation of silicate of iron and manganese, which is much more fusi-ble, and passes into the slag. For this reason the metal is not altered by a foreign body, and this is a capital point. In order to show plainly the complete structural difference between steels without blow holes obtained with silicon alone and those obtained with an alloy of silicon and manganese, Mr. Pourcel places two recepta-cles, one holding steel by silicon alone, and the other steel by an alloy of silicon and manganese in a porcelain tube. A current of chlorine is passed until all the iron is removed in a state of chloride. It is seen then that in first receptable there remains a net-work of silicate of iron preserving the original form of the pieces, while the steel by alloy leaves no residuum.

As a general rule, all metals possessing a crystalline texture are brittle, as for instance antimony, bismuth, and zinc in ingots; while a confused and irregular texture corresponds to the greatest resistance. Steel is not an exception to this rule, and if a fracture is crystalline the piece is very brittle. Fortunately, this defect can be modified in several ways.—1. By simple re-heating to cherry red, when an ingot with coarse fracture, and completely lacking the requisite strength, will suddenly be transformed after ordinary cooling into a fine grained and strong product.—2. By hammering at a sufficiently high temperature cast steel loses its crystalline structure, provided this hammering is continued while cooling takes places down to a certain point varying with the different steels, and beyond which the metal preserves its whole power of re-sistance. If hammering was left off at a high temperature, and the metal abandoned to itself, the crystalline structure would re-appear, and with it the lack of strength.—3. The rapid cooling of a cast metal also destroys the crystalline state; this was observed in wrought-iron ar-mour plates. Steel, then, seems to behave like an exceedingly concentrated dis-solution of a salt easily crystallisable, the crystallisation of which is prevented by certain precautions only.

In spite of the seeming boldness in substituting cast for forged steel, in spite of the little faith of the ordnance men themselves, at this moment the steelworks at Terre-noire manufacture regularly 9½-in. projectiles, capable of penetrating at an angle of 30° plates 8 in. thick, with the relatively slow speed of 1400 ft. per second. The projectiles never break—sometimes the point is slightly bent. It is not known yet whether it will be possible to begin immediately the manufacture of cannons in one piece, as was formerly done in cast iron cannons for the navy and the defence of towns. But there is one idea which presented itself naturally, and which is being studied even now—it is nothing less than the replacing the cast-iron body by a cast steel one in coiled guns. Thus, a metal hardly able to stand an effort equal to 20 tons will be replaced by another requiring 33 tons at least to break it, supposing, for security's sake, that the softest metal was used. As to the different industrial applications of the new metal, they naturally present them-selves to every mind, and we might even say they will push themselves forward, bearing with them these two great advantages—solidity and economy.

The PRESIDENT proposed the vote of thanks for the paper, and said that before opening the discussion he would ask the secretary to read a letter from Mr. F. Webb, of Crewe, upon putting mild steel in proper form for resisting strains.

Mr. WEBB said: I left at your office on Monday last nine photographs of rivetted joints in mild steel tested to destruction. These tests were made here some time since to find out the best proportion of longitudinal joints, and I thought they would interest you, as they show how well adapted mild steel is for boiler purposes. We first began with the ordinary proportion for iron, 4-in. welds on either side, so as to put the rivets in double shear, rivets ¾ to 1 in. to centre from edge of plate, and 2-in. rivets, giving the result as shown in No. 1 photograph. We finally arrive at the one shown in No. 8—5¼-in. welds, with the rivets ¾ in. to 1⅝ in. from edge of plate to centre of rivet, and 2 in. pitch. As you are aware, we make our plates in use in circumference, and place the longitudinal joint out of the water, so that we get no corrosion. I may mention that we have now over 800 boilers in steel of similar quality, and I have every reason to be satisfied with the result. I have also a few copper fire-boxes replaced with steel, but I do not care to use steel much for this purpose, as when worn out the scrap copper is so much more valuable, but still I am watching the result carefully. I am sorry that, having to be with my chairman, in Lancashire, I shall not be able to attend the meeting, as there are several papers of much interest, and I was anxious to get the opinion of the mem-bers, if possible, on the subject of annealing, which does not seem to be clearly understood, my own opinion being, from practice, that in mild steel it is sufficient to get the plates to a good red heat, so as to put all the particles at rest after the work has been put on the plate, and nothing more. From some scale I had shown me last week, I am sure that some people are overdoing it, and doing mischief

instead of good, for which, if any accident happened, the maker, and not the user, might get blamed, if not the material itself, though not in fault.

The PRESIDENT regretted that Mr. Webb was not present to take part in the discussion, and as time would be saved by making the discussion general on steel, he would ask Mr. Riley to give them an abbreviation of his paper, and he would add that he intended to ask the members at the same time to criticise his address, and all this could be done together.

Mr. RILEY, in giving the outline of his paper, said that he found that users were purchasing as manganese what was really manganese *plus* something else, so that he felt it necessary in the analyses he made to return manganese only. There had been constant disputes during the last 14 years as to the percentage of manganese. He found at the time when Mr. Henderson introduced the ferro manganese that the continental method of estimation was 2 per cent. too high, whilst the estimation by difference was rather too low—lower than the direct method. The method of taking the samples was very simple. They took five pieces from each wagon, knocked a portion off each, and these were crushed, and the percentage estimated. If the spiegeleisen were bad all the impurities goes into the manganese, and is estimated therewith. The estimation by difference had, however, the advantage that the duplicate estimate could be made in one hour, whilst the direct process took five or six hours, and for many purposes the former was sufficiently accurate. To a certain point he found that the percentage of carbon increased with the manganese. At the Krainische Works some tests showed that the reverse was the case, but he must say that he had since carefully investigated the matter afresh, and his results did not correspond with those of the Krainische Company. Up to 25 per cent. he believed the carbon and manganese increased simultaneously. He did not think that the colour test could be used for high percentages of carbon, and believed that Mr. Gautier would say that at the Terre Noire Works the carbon and manganese was found to increase simultaneously. He believed, also, that errors were sometimes due to the oxide of manganese not being sufficiently highly heated. He found that the oxide of manganese was usually contaminated with a large proportion of baryta, and when manganese was 14 per cent. the error of estimate in excess would amount to 4¾ per cent. In rich auriferous ores the error was frequently 1 per cent., which they must remember on a 1000 ton cargo at 1s. per unit was 50*l*. Manganese seemed to have a greater affinity for the baryta than for the silica, so that particular care should be taken that it is free from baryta. The continental chemists say that with acetate of ammonia he (Riley) did not get so high a result as with acetate of soda, but he contended that acetate of soda gives 2 to 2½ per cent. above the truth, and owing to the impurities likely to combine with the manganese it was not difficult to get almost any result by different methods of manipulation. The Italian ores were particularly liable to error in this respect. He considered that it was a great error to make duplicate analyses with similar quantities, and by similar processes, as it was really no evidence that the result was correct, as the error in one was likely to be repeated in the other. He found that analyses could be very correctly made by young chemists after a little careful drilling, and that upon giving samples to two working independently their results would agree very closely. If the ore forming the general cargo were not very fine care must be taken not to send up too large a proportion of large pieces, as these would give a higher result than the mass. As to the Cartagena ores, he thought it would be better to sell on the dry sample. These ores would only absorb about 2½ per cent. of moisture, whilst the Lincolnshire and other English ores would absorb as much as 7½ per cent.

The PRESIDENT said that Mr. Riley's paper was one which was not only interesting to chemists but also to steel manufacturers generally. It was evidently useless to estimate by difference, for Mr. Riley had revealed facts that the residue taken as difference may be baryta silicon, and they might find half-a-dozen other things which they had been purchasing as manganese, and this might also account for the provoking differences met with in the steel produced by what appeared to be identical methods of manipulation. He would now open the discussion on the three communications which had been brought before them.

Mr. GAUTIER described a method of estimating the manganese by oxide of lead and arseniate of soda, the results coming as near as 0·380 instead of 0·377 for manganese, as compared with the method described as most correct by Mr. Riley. The method of estimation is similar to that of iron by the chromate of potash process.

Mr. HENRY BESSEMER wished to say a few words on Mr. Gautier's paper. In the Exhibition of 1862 he exhibited a number of castings in steel, including a 17-cwt. ingot, to show that cast-steel could be produced with no air-bubbles. It was produced by the use of iron and manganese. He ascertained in his works at Sheffield that when the best Swedish iron was put into the crucible and left only a sufficient time to fuse it was bubbly and brittle, but when left in for an hour it became well melted. He at once sought the chemical difference, and ascertained by six or seven samples of good and bad that the well melted always contained some silicon. Seeking the source of the silicon he found that the plug-hole in the crucible used for facilitating shaping was stopped with sand, so of the silicon, in which, when the metal remained long in the pot combined with the steel. He found, too, the Tow Law Ironworks could give them a semi spiegeleisin, with 3 or 4 per cent. of silicon and about 7 per cent. of manganese, and by the use of this alloy they got sound ingots. He would take the opportunity of mentioning that Schneider, of Creusot, sent over his manager, who passed a month at their works at Sheffield, and he (Mr. Bessemer) supplied that firm with 22 sheets of drawings. Mr. Schneider, jun., was also at their works, and he might tell them that in order that they should not commence a work without security of results they gave both the manager and Mr. Schneider, jun., every information in their power. They were thoroughly satisfied that they could make good iron by the process, and the erection of the machinery was at once commenced, but such delay was used in its completion that it was only ready six weeks before his first patent expired, and they refused to pay him a farthing. As he had said this with regard to Creusot and its proprietors in speaking of the present paper, he should mention that Mr. Gautier was not connected with the Creusot, but with the Terre Noire Works.

Mr. RILEY said that he had made at Messrs. Kitson's works silicide of iron up to 23 per cent. of silicon; and he might mention that in Mushet's titanium steel he could find no titanium, but there was 1½ per cent. of silicon. With an iron with 2 per cent. of silicon so hard a tool was made that he turned off a chilled steel rail. As to the relation between silicon and carbon, he had found invariably that as the silicon went up even to beyond 20 per cent. the carbon went down.

Mr. GAUTIER stated that their alloy of silicide of manganese was made in a blast furnace.

Mr. RILEY thought there was no doubt that if they had too large a quantity of fuel in the furnace and thus burnt out the carbon they could get a siliceous iron.

Mr. A. L. HOLLEY (of America) said that he had had the opportunity of examining the steel at Terre Noire. It was in America a matter of great importance to produce castings instead of forgings, and he, therefore, tried to see whether steel without blow-holes could be regularly produced. He believed that there were many iron and steel processes which had completely failed because the exact conditions of success were not thoroughly understood. He found that in the Terre Noire process a great degree of accuracy was necessary both as to what should go into the bath and as to the precise time at which it should go in. The Terre Noire Company allowed him to examine everything most minutely. He found the conditions of success to be that the oxygen must be preserved in the metal, and that the carbon must be kept out to the greatest degree. Some carbon was introduced in the ferro manganese and ferro silicon. The bath was made entirely of spiegeleisen, and care was taken to keep plenty of manganese in stock, and to remove the oxide of iron that is formed. The colour of the slag was a delicate test of the percentage of manganese in the steel. Careful observation of the black and olive green lines would at once determine whether damaging oxidation were going on in the bath. But towards the end of the operation the carbon and manganese must be pretty well burnt out. The slag colour test he regarded as almost conclusive. A little ingot of 1½ inch square, flattened into a disc, which was examined for cracks at the periphery, showed the condition of the metal. The colour of the slag, the softness of the steel, and the fluidity of the steel had to be taken into consideration, and the soundness of the castings to be made could thus be accurately determined. The three conditions, however, must be obtained simultaneously. He formed the conclusion that the means of discovering the defects were very simple, and that the remedies were complete, and much more numerous than the defects. With ordinary skill it was perfectly easy for the operator to make the solid steel with as much certainty as ordinary steel. To show that the process was well in hand, he need only say that the Terre Noire Company had been making the steel for some years. During the three weeks he was at Terre Noire only two charges got out of control, one of these being because the roof of the furnace fell in. He considered that to the Terre Noire Company was due the credit of having developed a substantially new process. Many sound steel castings have been made at Terre Noire by Messrs. Euverte and Poucell as the result of the experiments which they had for some years been carrying on; and although the broad principle might have been long known, they had arrived at an entirely new process as to the times and seasons at which the several steps in it were performed. He believed it would prove to be one of the most important open air processes ever discovered.

Mr. G. J. SNELUS considered the thanks of the Institute due both Mr. Gautier and to Mr. Holley, and remarked that he believed soft steel with ferro-manganese would replace copper, and experiments which he had made confirmed that view. They all now knew that burnt iron means siliceous iron, and he believed they would get a compound of iron, manganese, and silicon for a cheap product to be used instead of forgings. If the silicon were in the steel without carbon the steel would be tough, and bear a high strain, and they always found the manganiferous metal to be a soft metal, and the siliceous metal a good casting metal. He thought they could not give the Terre Noire Company too much credit for what they had done.

Mr. STEAD generally confirmed Mr. Riley's views as to the estimation of manganese.

Mr. SNELUS suggested that the Terre Noire process could be as well carried out by the Bessemer as by the Terre Noire process.

Mr. BESSEMER would mention that the samples shown at the Exhibition of 1862 were not mere specimens, and that since that date they had continued and very much increased in the making of these castings. They had at present many cast-steel cranks running under locomotives which had never been touched with a hammer, and they found that a ¾-in. slab taken out would bend together on itself without showing defects.

Mr. HADFIELD has also a three-double throw-crank at work which had never had a hammer on it.

Mr. D. ADAMSON considered that as contraction in cooling could not be avoided, the contraction of a 12-inch tube being equal to a ¼ in. in the diameter, much advantage was derivable from Whitworth's system of compression, which was successfully carried on in Manchester, if it could not succeed in France. He agreed that soft steel could replace copper, for he had never seen copper undergo the punishment of beating a dome 2 ft. diameter and 2 ft. high out of a solid sheet, and with wooden mallets, so well as soft steel. With copper such a feat was only possible with frequent re-annealings and the utmost care.

(To be continued in next week's Mining Journal.)

BRITISH IRON TRADE ASSOCIATION.

The first annual general meeting of this Association was held at the Westminster Palace Hotel to-day (Friday) under the presidency of Mr. G. T. CLARK. The proceedings were of a private character. The subjoined is the report of the board of management presented to the meeting.

The British Iron Trade Association was established early in 1876 for the purpose of providing an organisation that should deal with all matters of general—that is of imperial—interests affecting the iron and steel industries of Great Britain. The need for such an Association had long been deeply felt, and when the proposal to form it was brought forward it was cordially received by the leading iron and steel manufacturers throughout the country. The inaugural address of the president, delivered in February, set forth very fully the scope of the Association, and pointed particularly to several matters that might with great advantage to the trade engage the attention of the board.

At the conference which followed upon the address various topics suitable for the operations of the Association were raised and discussed, and special committees were formed to take up the following:—1. The rating of mines.—2. The treaty arrangements with France.—3. General parliamentary Bills affecting the trade.

The committee on the rating of mines acted jointly with the Mining Association of Great Britain. A deputation from both associations waited upon the President of the Local Government Board, Mr. Sclater Booth, who had introduced the Rating Bill of last session, and laid before him the modifications which the iron and coal trades wished to have introduced in the Bill when before the House. It was not requisite to take further action in this matter, as the Bill was eventually withdrawn. The committee on the treaty arrangements with France, and of which Mr. Samuelson, M.P., was chairman, having in view the probable negociation for a renewal of the existing treaty at an early date prepared a memorandum setting forth the manner in which the iron trade had been affected by the arrangements entered into between the two countries in 1860. In this document, which was duly presented to the Foreign Office, it was shown that the duties charged on English manufactured iron had proved in nearly all cases to be prohibitory, and the committee made sundry recommendations as to the modifications it would be desirable to effect, which were mainly that the duties should be so arranged as not to exceed the equivalent of 10 per cent. *advalorem*.

At a general meeting of the Association held in Leeds last September this memorandum was considered, and after discussion, Messrs. Samuelson and J. Lowthian Bell were requested to take charge of the matter, and, if requisite, to visit Paris with the view of conferring directly with the French authorities relative to suggested modifications in the treaty arrangements. It was, however, ascertained later on that the proposals of the French Government were not likely to be put in shape for some time, and hence no useful result could have been secured by visiting Paris. Meanwhile the French Ministry requested Mr. Gavard, the first secretary to the French Embassy in this country, to meet at the Foreign Office the representatives of any commercial bodies that might be desirous of making any suggestions relative to the terms of the proposed renewed treaty. Accordingly, a deputation waited upon Mr. Gavard, and laid before him the views of the Association, which were embodied in supplementary memoranda that have since been published and circulated amongst the members of the Association. Within the last fortnight the French Government has invited that of this country to enter into negociations for the revision of the Treaty of 1860 in Paris. Commissioners have been appointed, with whom your committee is in communication on this important subject; they will if necessary proceed to Paris, and will in the meantime be glad to receive through the secretary any suggestions which the trade desire to offer for their guidance or information. The Parliamentary Committee upon the General Bills of last Session had under consideration the Bill on the Liability of Employers to Workmen. They were not called upon, however, to take any action upon it as this Bill also was withdrawn, and a Select Committee appointed to report upon the subject. The committee of the Association will consider the desirability of giving evidence before the Select Committee.

The board has been requested to take supervision of such railway and other Bills as may be brought before Parliament, and which may contain clauses likely to operate to the prejudice of the iron trade generally. Last Session a Bill introduced by the Great Western Railway Company contained such a clause with reference to the compulsory purchase of minerals under and for a certain distance on each side of the line of railway. Through the opposition of the mineowners more particularly interested the Bill was thrown out; but this Session the Omnibus Bills of several of the principal railway companies contain clauses of a highly objectionable character, and that ought not to be allowed to become law. The board have laid down in the following resolution the position which they propose the Association shall take with reference to such railway Bills:—"The board consider it to be the duty of this Association to watch any attempts at legislation, either by private or public Bills, affecting the general interests of trade, as distinguished from those of particular districts, and the council will be much obliged if the local organisations will call the attention of the Association to all such general questions as they may arise."

Shortly before the Association was formally constituted a communication was received from the Foreign Office through the president of the Associated Chambers of Commerce, having reference to the action then being taken by the German iron-masters with a view of inducing their Government to postpone the abolition of the import duties on foreign iron sent into Germany, alleging as the principal reason that the iron industries of Germany were at that time exceptionally depressed. Lord Derby (our Foreign Minister) wished to be informed as to the prevailing condition of the iron trade in this country, and suggested the collection of certain statistical information upon the subject. The board at once proceeded to deal with the matter, but owing to the very recent and on some points imperfect organisation of the Association it did not possess the means for collecting full statistical particulars of the trade from all parts of the country, and consequently it was found impracticable fully to carry out Lord Derby's proposal. The president, however, collected very full statistics of the Welsh branch of the trade, and from them drew up a general memorandum, which was forwarded through the Associated Chambers of Commerce to the Foreign Office, and has been published and circulated.

Special reference was made at the Conference held last spring to the delay that has up to this time taken place in publishing the official Mineral Statistics, prepared under the superintendence of Mr. Robert Hunt, Mining Record Office, Jermyn-street. It was hoped that the attention thus called to the matter would have resulted in their being in future made available at an early date after the end of each year. As far as the Mining Record Office is concerned the board find that in the year 1876 the statistics for 1875 were completed in August, being three months earlier than in the previous year. But notwithstanding this, though ready for publication, and, it is believed, actually printed, they were not published until December. This unnecessary delay caused great inconvenience to the trade, and the board have considered it a matter of so much importance that they have caused representations to be made in the name of the Association to the proper authorities, strongly urging that the publication of this valuable information may not again be delayed.

TECHNICAL EDUCATION IN THE CITY.—For several years past the Worshipful Company of Turners have offered handsome premiums in the shape of silver medals and the freedom of the company, practically carries with it the freedom of the City of London to the workman, whether master, journeyman, or apprentice, displaying the greatest ability in turning; the material to be wrought upon being varied from year to year, so as to include every branch of the trade. The subjects chosen for this year's competition are turning in ivory, in pottery, in stone and jet, and in steel, brass, and gold for horological purposes. The competition in ivory includes vegetable ivory. The qualities which will be considered in awarding the prize will be—beauty of design, symmetry of shape, utility, and general excellence of workmanship, exact copying, so that two objects produced may be facsimiles in every part, or exact measures of capacity; fitness of work and design for the purpose proposed; ability to turn whether circular or oval; novelty in application of turning or in design; carving is admissible, but it must be subsidiary to the turning, and must likewise be the work of the exhibitor. The competition in pottery will include terra cotta, stoneware, earthenware, and porcelain. The freedom will be given for the best piece of pottery thrown on the wheel, but not afterwards shaved or turned in any way or glazed; the silver medal will be given for the best piece of pottery thrown and turned; and a bronze medal will be given to the competitor second in merit in each class. The competition in stone and jet includes any natural substance of a mineral character, and in that in metals for horological purposes perfect truth, accuracy, squareness of parts, &c. In addition to the freedoms, silver and bronze medals, and certificates of merit, the Court of the Company gives 50*l*., and Baroness Burdett Coutts 25*l*., to be distributed in money prizes. The judges will be—in ivory: Messrs. Chas. Hutton Gregory, C.M.G.; John Jaques; Thos. B. Winser; and Morgan Yeatman. In pottery—Messrs. Alfred J. Copeland, Henry Doulton, and John J. Holtzapffel. In stone and jet—Sir Geo. Gilbert Scott; Dr. Wm. Pole, F.R.S.; Mr. Vazie Simcox; and Prof. Tennant. In steel, brass, and gold, for horological purposes—Sir Joseph Whitworth, Bart.; Messrs. John Jones, S. Jackson, and Mr. Lewis Donne (silver medallist in 1872). The specimens sent in for competition will be exhibited as usual

Royal School of Mines.

LECTURES ON MINERALOGY—No. V.

[BY OUR SPECIAL REPORTER.]

The fifth lecture of Prof. SMYTH'S course to working men was on the subject of the ZEOLITES, OR HYDRATED SILICATES. He said he had ventured to bring before his audience a group of minerals to which in this country very little attention has been given, principally for the reason that, as far as we yet know, not one of them has been turned to any useful account in the arts, and we are apt to regard all things more or less from a practical, or rather economical, point of view. The endeavour to ascertain the reason of their existence, and the cause of their presence under certain circumstances, will yield to the mind of the thinking man an ample reward. At the end of the last century and the beginning of this, when our army and navy were occupied in a series of arduous conflicts, which culminated in the battles of the Nile, Trafalgar, and Waterloo, there went on at the same time for many years an internecine war of a very different character—a war among the scientific men of Europe, in which an enormous quantity of ink instead of blood was shed. For a period of 30 or 40 years this was unappeased, but at length by slow degrees a peace was patched up, though there is a tendency at the present day on the part of some people to burst into hostilities again. The parties in this warfare were on the one side the disciples of Hutton, of Edinburgh, and on the other the followers of Werner, the geologist of Freiberg; and the subject of strife was the origin of certain classes of rock, to which the names of basalt and trap are given. In the southern part of Scotland is a district in which these rocks are very largely developed, extending from the celebrated Arthur's Seat, near Edinburgh, to Dumbarton and district west of the Clyde. Dr. Hutton's views were that these rocks had an igneous origin, that they were similar to what are known to be volcanic rocks, though they do not now show any signs of decided craters, nor such appearances of having once flowed as lava streams as would readily catch the eye. Those who held this view were called Plutonians, from Pluto, the god of the lower regions, since they affirmed that these rocks had their origin in his dominions. On the other hand, Werner taught that these rocks had their origin in the sea as sediment, after the manner of sandstone or ordinary sedimentary rocks; hence from Neptune, the god of the sea, his followers were called Neptunians. An appearance strongly urged by the latter school in favour of their views was that where beds of these basaltic or trappean rocks were regularly stratified with beds of sandstone, shale, or even coal, hence, said they, why ascribe to the basalt an origin so different to that of the sandstone or shale? To these, of course, it might be answered that the bed of basalt had been thrust in, or intruded, between the other beds, or had been poured out as a lava stream at the bottom of the sea, and the sand and mud subsequently deposited on it; and we are not without evidences that this is what has indeed taken place on a large scale.

Another point in the controversy was founded on the fact that in a great number of these rocks a certain set of minerals was found to exist. In these rocks may often be seen cavities having more or less the shape of an almond, and the cavities are very frequently filled up with diverse substances, which have a composition very different from that of the rock around them. Rocks of this kind exist in abundance in North Wales, where, however, the cavities are small, and almost universally filled with calc spar. In other cases, as most notably in Paraguay, in South America, and on the borders of France and Germany, at Oberstein, they are apt to contain quartz under different aspects—chalcedony and agate. In other cases we find the cavities filled with a series of whitish or pinkish minerals, sometimes more or less radiating in form, sometimes beautifully and distinctly crystallised. When this series of minerals came to be examined it was found that in one or two respects they all agreed, whereas in others they differed. One point of similarity was that from whatever locality they were derived—Scotland, Iceland, Faroe Islands, &c.—this group of about 20 distinct minerals when exposed to a strong heat (as at the point of the blowpipe flame) melt with great facility, and at the same time bubble up and boil, sometimes with curious contortions. On this account from the Greek word "zeo," to boil, the group was designated by the general name of the zeolites, or boiling stones. Among other points of agreement may be mentioned that they all are very light compared with most stoney bodies, the specific gravity ranging from 2 to 2·4: again, they are all of light colours, and translucent, sometimes passing into certain tints of pink and red; and the hardness also is considerable for bodies of this character, being greater than that of marble, for example. The districts of Europe which yield these zeolites most especially are the eminently volcanic district of Iceland and Faroe Islands, which partake of the character of Iceland, and are extremely rich in these substances. In Norway, in the masses of magnetic iron ore a remarkable group of these zeolites occurs, the individuals being very small, but very brilliant. In our own islands the Giant's Causeway is noted for their occurrence; the rocks of Staffa are not so rich; from the neighbourhood of Dumbarton, and across Scotland to Edinburgh, is a region most remarkable for the presence of these zeolites. Another rich district is the old volcanic district of Auvergne, in France; also on the Lower Rhine the district called the Eifel, which likewise shows evidences of volcanic action in former times. North Bohemia is a notable district, and they occur also in some districts of Hungary, while a great many have been obtained from North Italy, and in the South of Sicily are some very interesting examples. The part these zeolites played in the controversy referred to was this; it was found that all of them contained water, and some of them a very considerable proportion (as, for example, 21 per cent. in chabasite); hence the Wernerians claimed a triumph, for they said these substances must have been formed in the presence of water, therefore the whole rock must have been formed in water. This argument seemed very plausible, but at last, by careful study of the volcanic rocks at the present time, the true nature of these cavities has been ascertained. They are really cavities formed by the presence of gas in the rock when in a soft or viscid condition—air or gas bubbles, in fact. All experience goes to prove that they were originally empty when formed; the filling, when it has taken place, has been a subsequent process. The substances which fill the cavities have been introduced by water carrying various matters in solution, and deposited on the sides of the cavity, by reason of various causes, such as change of temperature, evaporation, evolution of gases, or chemical decomposition. And thus there is an end to the triumph of the Neptunian school.

Examples of these zeolites may be seen in the Museum above (the Geological Museum, Jermyn-street); or in the magnificent collection at the British Musuem, perhaps the finest in the world as regards this group, many of the finest specimens there exhibited being due to the patriotism of British engineers employed in constructing a railway up the Ghauts, in India. The first group of these minerals is distinguished as the fibrous and radiating zeolites, its three important members being "natrolite," "scolecite," and "thomsonite." As an example of the constitution of these bodies

we may take natrolite, which contains in 100 parts 46·9 silica, 26·9 alumina, 3·7 lime, 12·8 soda, 9·5 water. These occur in great beauty on the Kilpatrick Hills, near Glasgow, at the Giant's Causeway; and Thomsonite at Belin, in Bohemia. A second group, distinguished as the foliated zeolites, contains "stelbite," crystallised in the rhombic, and "heulandite," in the oblique system, the former occurring in beautiful crystals or masses of Iceland spar. "Brewsterite" also belongs to this division, and its composition is remarkable as containing both baryta (nearly 6 per cent.) and strontia (upwards of 9 per cent.) It occurs in very minute crystals, which often exhibit a pearly or nacreous lustre on certain faces, and it is especially a British mineral, occurring most notably at Strontian, in Argyleshire. Next comes a group called cubical zeolites, containing "chabasite" and "analcine." The crystals of the former were at one time believed to be badly formed cubes, but they are in reality rhombohedrons, and consequently it belongs to the hexagonal system, Analcine, which means "without strength," was so called on account of its extremely weak electrical properties: it usually exhibits a whitish colour, with much opacity, and presents a very interesting crystalline form, usually that known as the icositetrahedron. It occurs at Dumbarton, the Giant's Causeway, in the Tyrol, and in some very interesting localities at the base of Etna. Their occurrence in the latter locality the lecturer described at length from personal knowledge, giving an interesting description of the rocks—containing small crystals of analcime—which Homer says the taunted Cyclops threw at the retreating Ulysses, although the lecturer was satisfied from the nature of the rocks that they had never formed any part of Etna, as the poet sings. The last group of zeolites contains two —"phillipsite" and "harmotome"—the former occurring in minute crystals, the latter in larger crystals, which are often peculiarly arranged and fitted together so as to present the form of a cross; these occur at Strontian and in the Harz district. In the great number of localities hitherto spoken of as yielding zeolites they have been associated with volcanic rocks, and only very rarely with others. But in the silver mines on the south side of the Harz, especially at Andreasberg, in certain veins, a whole series of these zeolites have been found, with silver ore and calcareous spar, an occurrence which it is very difficult to explain. In North Italy, near Lago Maggiore, these zeolites occur in granite, as they do also at Strontian, in Cornwall, and consequently are associated with a set of minerals totally distinct from those of the volcanic and trap rocks, with which zeolites almost universally occur.

In conclusion, the lecturer showed that it was an extremely probable supposition that these minerals were due to the action of percolating water, which as it travelled took up various substances, and subsequently under other conditions re-deposited them, perhaps under a changed form, in favourable repositories.

MINING AND STOCK EXCHANGE NEWS OF THE WEEK.

Messrs. F. W. MANSELL and Co. (Sworn Stock and Share Brokers), 43 and 43A, Palmerston Buildings, Old Broad-street, write to us as follows:—

THE "BONANZA KINGS" (No. III.)—If we were asked to select from among all the men that California events have brought to the surface, that one upon whose fortune pure chance has had the least influence, we should name James C. Flood, who was born at New York City about 1828; his education is sound and practical in all English branches; to this knowledge Mr. Flood has added, by a general line of reading, a familiarity with the history and literature of the world, and a wide acquaintance with passing events. The effect of the gold discoveries of California in 1848 was a sort of intellectual conscription in which the physical and mental energy of the world was drafted into the expedition to the Pacific Coast. If it had been desired for any reason to select from the youths just arrived at man's estate in the spring of 1849, the finest and most energetic minds, and to set them aside into a special class, no system of examination would have procured so perfect a choice as was made by natural selection in the struggles of the strongest to get away from home, and to find their way to California. In this uprising of youthful ambition James C. Flood pushed out into the great ocean of adventure, and found himself in San Francisco in 1849. Like most young men of that period, he was without capital, save his own will and natural forces. How he struggled in the commencement, first at one thing, then at another, as chance threw honest employment in his way to secure subsistance; and that obtained, to lay up a little capital, it is not necessary to give in detail. In 1854 he associated with William S. O'Brien; it was then that they began those mining enterprises that have already resulted in rendering them the richest capitalists of this and possibly of any age. The first notable enterprise engaged in by Flood and O'Brien consisted of operations in the Kentuck and other mines on the Comstock, in which they generally contrive to secure a controling interest; this was as early as 1862. Their operations in Hale and Norcross, a few years after, were on a scale so large as to attract general attention to them as mining speculators. But the operations which finally made the name of this mining firm known throughout the world has been compressed within the comparatively short space of the past two years. The existence of those vast bodies of ore in the Consolidated Virginia and California Mines, which gave them the name of "bonanza," thus adding a permanent word to the English language, was suspected as early as February, 1874, and were made certain by the proprietors in December of that year. The generosity with which they dealt with those who had the good fortune to be their friends is generally known; they were not content to see their own fortunes growing with colossal strides each hour, but desired all who had been kind to them in the past to accompany them on the road to prosperity. Many of California's wealthiest men of to-day would confess that to the fortunate circumstance of their good relations with Flood and O'Brien in years gone by they alone attribute their being rich instead of poor. The establishment of the Nevada Bank is the idea of Mr. Flood, who has resolved that his bank shall grow up in San Francisco sound in capital, and with a reputation throughout the world that shall be built upon genuine merit. It has been remarked by thoughtful men, to whom Mr. Flood has been known from youth, that all he is now was foreshadowed in him from the first; that whatever situation he was placed in for the moment he was always equal to, and performed his part in a grave, quiet, and thoughtful manner, marked rather by force held in reserve than by that actually employed.

Referring to the January yield of the productive mines, a San Francisco paper says:—

The yield of the producing mines for the month of January foots up, so far as known, over $3,000,000, of which California makes a showing of $1,630,000. The same mines for December produced $1,697,500, the two bonanzas yielded $593,000 more in January than in December. Following are the returns of the heaviest producing mines:—

Belcher	$ 37,200
California	1,613,700
Chollar-Potosi	77,700
Consolidated Virginia	519,300
Empire (Grass Valley)	17,800
Justice	233,400
K.K. Consolidated	52,500
Leopard	47,500
Manhattan	100,300
Modoc Consolidated	114,500
New Coso	56,800
Northern Belle	160,600
Ontario	22,700
Ophir	3,300
Tybo Consolidated	48,700 = $3,109,000

California, for February, will show a larger yield, and so may Consolidated Virginia. Among the outsiders, we shall have a better result from Northern Belle, New Coso, and Leopard, while two new producers (Leeds and Grand Prize) will be added to the list. It is, however, a short month, so that the aggregate produced will show a falling off.

We have already directed attention to the misleading information communicated by the Times correspondent concerning the condition and prospects of the Bonanza Mines, and the unnecessary apprehension thereby created in the minds of English holders, many of whom sold their shares at panic prices. The groundlessness of these apprehensions we have persistently urged, and every mail brings us corroborative intelligence. The latest information, dated March 1, is as follows:—

The California Mine never looked better. The drift from the drop winze on the 1850 ft. level is in superior ore. In Consolidated Virginia all the stopes and levels are looking and yielding as well as usual. The 1200 ft. level, which connects with the Gould and Curry shaft, has been cleared and re-timbered to the extent of 150 ft., and 150 tons of ore was taken through the Gould and Curry shaft last week. On the 1650 ft. level, west drift, a drift north was commenced on the 19th to intercept the California drop winze. This drift is now in 17 ft. in good ore, and will be finished to-morrow or next day, thus affording improved ventilation. The ore operations last week were as follows:—

	Con. Virginia.	California.
Extracted ... Tons	18·0	3883
Sent to mills	1593	4006

There were further bullion shipments from both mines on Saturday, and the complete list on February account is as follows:—

	Con. Virginia. Bars.	Con. Virginia. Value.	California. Bars.	California. Value.
Feb. 8	19	$64,763	—	—
Feb. 13	17	58,091	67	$266,612
Feb. 15	7	24,586	29	120,012
Feb. 17	6	19,638	33	132,746
Feb. 20	6	24,237	38	160 286
Feb. 24	8	27,407	51	209,357
Total	53	$218,720	218	$818,893

It should be remembered that there was a holiday last week.

AMERICAN MINES.—The gross yield of the precious metals during 1876 is valued at $90,875,000. The total value of the coin manufactured at the two Pacific Coast mints last year was as follows:—

	Gold coin.	Silver coin.
San Francisco	$32,022,500	$10,682,000
Carson	2,854,200	3,392,400
Total coinage	$34,876,700	$14,074,400

By adding the exports of bullion from San Francisco we have the total movement, as follows:—

Gold and silver coinage	$48,942,100
Gold bars and dust exported	3,488,100
Silver bars exported	10,759,400
Total	$63,189,600

ISABELLE (Gold and Silver).—From what has already appeared under this head, it is now necessary to reiterate that the earth's crust or shell consists of two distinct kinds of rocks—the plutonic or igneous, and the sedimentary or stratified. The former are composed of granite (which is the foundation rock), and porphyry, basalt, &c., which are more recent. These, as their names indicate, were formed through the agency of fire. They are sometimes forced up in a melted state, greatly changed by excessive heat and pressure, through the later or sedimentary formations, and receive the name of volcanic or eruptive rocks, such as lava, trap, &c. The stratified or sedimentary rocks were formed by sediment gradually settling down in water and eventually becoming stratified; for this reason they are sometimes called aqueous rocks. The most common of the stratified rocks are gneiss, mica slate, clay-slate, hornblende slate, talcose slate, quartz rock, sandstones, conglomerates, and limestones.

There are about 40 distinct layers or leaves to the earth's crust, each formed at a different epoch, and under marked conditions. Between the igneous and regular sedimentary formations are what are termed the metamorphic rocks, which are mostly stratified slates that have been much changed. It is in these stratifications that the valuable mines and ores are mostly found. Some of these are sienite, porphyry, greenstone, trachyte, amygdaloid, &c. Granite is composed of quartz, felspar, mica of different degrees of fineness or coarseness, and of every shade of colour, but usually grey. Sienite is composed of quartz, felspar, and hornblende—the latter sometimes absent; this is often called granite. Porphyry is a compact felspathic rock, of purple, brown, green, and other colours, with crystals of felspar disseminated through it. Greenstone is a compact rock, composed mostly of hornblende and felspar, and in colour is from dark green to brown or black. This and basalt, trachyte, and amygdaloid in all their varieties are called trap rocks.

Good service may be done in furnishing practical knowledge on this subject, so that those interested may judge for themselves whether they possess a property of mineral wealth, while a great amount of labour would be saved which would be thrown away in useless endeavours to find mineral where there is none.

The several main and subsidiary gold and silver veins in the Isabelle group of mines are, as far as known, like the Comstock, found in propylite, a species of porphyry varying much in its appearance at different points, as the crystallisation is coarser or finer, and decomposition more or less advanced. On the slopes of the mountain, as at Mount Davidson, sienite and propylite occur on both sides, and south various metamorphic rocks. Particularly the Mother Lode, its walls (like the west wall of the Comstock) are divided from the country rock by a well defined clay selvage. As far as seen the wall of the Mother Lode consists chiefly of vitreous silver ore, stephanite, and native silver, embedded in a quartz gangue. Besides these ruby silver, horn silver, and native gold.

EXCHEQUER (Gold and Silver).—Following up our remarks last week upon the reduction of silver ores, we may mention that the earliest attempts at working the Comstock ores were made in the spring of 1859 at Gold Hill, the means employed consisting of the common Mexican arrastra, some half-dozen of which were in use there before the rich ore deposit at Virginia City had been discovered. The number was largely increased soon after, several having been started near the site of the new discovery, and also on the Carson river, these last being driven by water. The owners of the Mexican, or as it was then called "the Spanish ground," erected extensive yards for working their ores by the patio process, there having as yet been no mills or other reduction works erected.

An experienced quartz miner and skilful metallurgist made a visit in 1860 to the newly-found silver mines of Washoe, and after carefully examining the character of the ores became satisfied that amalgamation could be thoroughly and economically effected by the use of the iron pans already employed in the gold mines of California. This idea was rejected as absurd by the old school of metallurgists, all of whom contended for the use of the German barrel or the Mexican patio process, some even insisting the ores could be satisfactorily treated only by smelting. Notwithstanding opposition on all sides, this experienced gold miner, Almarin Paul, gave his orders in June, 1860, to the Miners' Foundry, San Francisco, for the ironwork of this mill, which was driven by steam, and carried 24 stamps. This machinery, with all needed supplies, was carried over the mountains during the summer at an average expense of about 80*l.* per ton, this being before any wagon-roads had been constructed over the Sierra. As there was then but a single saw-mill running in the country the lumber required for this mill cost large sums, labour and materials being proportionately high. Notwithstanding these and other obstacles, the projector and manager of this new enterprise pushed it ahead with such activity and vigour that he had the pioneer mill of Nevada advanced so near to completion that steam was let on and machinery started in August, 1860, having cost 10,000*l.*

This mill, though a rude and unpretensious structure compared with some of those soon after put up, had nevertheless a long and successful career, earning large profits for its owner, and serving the mining public acceptably and well. On Gold Hill ores the first run was made upon a contract to work 4000 tons at $30 per ton—an arrangement that resulted to the mutual satisfaction and advantage of both parties. Before the mill had been running a week contracts had been entered into to work ore to the value of nearly 100,000*l.*, and so numerous were the applications that within three months the enterprising miner had commenced another mill to carry 64 stamps at a cost of 30,000*l.*

This week's advices state that the No. 2 stope in the 100 ft. level had been driven 24 ft., the vein being 3 ft. wide, 2 ft. of No. 1 pay-rock, and 1 ft. mixed with good pay-rock. The No. 1 stope in the 200 ft. level had been driven 16 ft., vein 3 ft. 8 in. wide, mixed with No. 1 pay-rock. In the 300 ft. level there have been placed six sets of timbers, and three sets in the 400 ft. drift, and one set at the station in the latter level. The report adds that there will be no difficulty to keep the mill constantly running. A cablegram to hand on Wednesday announced, "Mill and furnace started on Saturday, both working well."

I.X.L. (Gold and Silver).—Just now it may be useful to mention that from the period of the earliest discovery of the precious metals in the Silver Mountain district, the I.X.L. has always been regarded as one of its representative mines. The late Professor Ross Brown, in his capacity as the United States Government Surveyor of Mines, has borne his testimony as the prospective value of this property. Although the mine has yielded enough ore (some $50,000) from merely surface operations, conducted in the most primitive manner by needy prospectors, it ceased as a matter of course to be remunerative as soon as the necessary operations for opening out the mine in depth required to be commenced. Capital not being forthcoming the property remained in abeyance until purchased by the present company. To the above facts it seems necessary we should add that following the ledge an incline connects the two tunnels, which are 150 ft. apart in a vertical direction. The upper tunnel, following the ledge from the beginning, very soon enters a body of ore; which, worked by very imperfect amalgamation in a wet crushing mill, gave a result of $65 per ton from 200 tons. Another body of ore was found in the upper tunnel, not far from the first one, and 10 tons of selected ore, worked by barrel amalgamation, gave $225 per ton. A large amount of lower grade ore is in sight in both tunnels, the lower disclosing several ore bodies of more than average value.

This week's advices state that the north drift is in 486 ft. from cross-cut on the 200 ft. level, 12 ft. having been driven during the week; the face is in solid quartz, 4 ft. 9 in. thick, apparently medium ore, and the ledge looking well, with considerable water issuing from the end. The rise is up 125 ft. from this drift, 10 ft. having been driven during the week; the rise is in fine lode-matter, with occasional streaks of apparently good ore. There is also some good ore in the face of the drain-tunnel. Everything in and about the mine is running and working well, and before Midsummer it is anticipated that the new mill, described as one of the finest in the State of California, will commence to turn out bullion for the benefit of the shareholders here.

GENERAL MARKETS.—Uncertainty as to the issue of the negociations with Russia has had a depressing influence, and, as usual in such cases, speculators for the fall have had the advantage. It does not appear there was any better information than vague reports for the inference that something had gone wrong, but rumours, however vague, find some believers, and accordingly it is not surprising that, with sensitive markets, a relapse occurs. The decline, however, has not been great, since simply because it is believed that, having gone so far, the negociations will now be permitted to prove abortive. Foreign securities have been the most affected, but the transactions mostly speculative. The railway market has been featureless, very few transactions being entered into, and these leading only to the most nominal changes. American Government and railway securities have shown further dulness. American telegraphs have been firm, it being said that a return to a higher tariff is imminent.

THE WEEK.

SATURDAY, MARCH 17.—There was a very gratifying rise in the price of foreign bonds and railways to day, and for a Saturday the amount of business done was unusually large. There was a sudden bound in Russian bonds at the very opening, the 1873 Loan being dealt in straight off at 86½, and this was finally the closing price, being a rise of 1½ per cent.; but the greatest advance was in Kursk-Charkow—2½ per cent., to 76*l.* All the Hungarian issues were very strong, and rose quite 1½ all round. A satisfactory improvement was noticeable in Egyptian bonds, and if only the conversion could be pushed on more rapidly there is little doubt but that they would again come into favour at much higher prices. The 1873 Loan closed at 52, a rise of 2*l.* Turks were comparatively neglected; the General Debt, however, rose 5-16ths, to 12¾, and the 1871 issue 10s., to 29½. Railways were a very good market, without, however, showing the same buoyancy as foreign bonds, the reason being that they are already pretty deeply committed for a rise. The best market was Dover, A, which advanced 1¼, to 116, mainly on the issue of a very satisfactory working statement, showing an increase of nearly 3000*l.* for the month. The cost of the "slips" between Folkestone and Dover, of course, does not appear as yet. Brighton, A, rose ¾, to 107; and Great Western ⅛, to 103¾. Cape Copper shares were dealt in at 41, Hudson Bay at 13⅜, and Crystal Palace at 20.

MONDAY.—The eagerness to anticipate a peaceful finish to the Easter Question was again very prominent, and those who were left "bears" on Saturday in foreign bonds stood to day in rather an unenviable position. In Russians there was no chance to get out other than at a serious loss, and some in consequence forebore to close, contenting themselves with selling a little more at the top price to average. No doubt this will turn out to be the best course, as there must be a reaction from such a rapid rise. The jobbers were throughout the day in a state of great excitement, encircling and eagerly challenging any one they thought might be a seller. Russians of 1873 reached 88¾, and maintained this to the close, nothing like such a price having been reached before this year. Egyptians of the same year went to 54½, but closed 1 per cent. lower. There was a rise of 2½ in Hungarian Fives (1871), to 64½. There is some hope, it is stated, of getting out another loan if the price of this and other issues can be pushed up about 10*l.* higher. The various issues of the Foreign and Colonial Government Trusts were benefited to the extent of an average rise of 2*l.* In railways Caledonians led the way at an advance of 1⅝, to 127½; North British touched par; Great Western, 104; Great Eastern, 52; Dover, A, 117; and Metropolitan, 107. Several mining shares had an advance, and among them Chicago to 4¼, and Eberhardt to 9. West Tankerville was offered at 1⅝, and Van Consols at 2⅝.

TUESDAY.—From Lord Derby's statement last night, it was abundantly apparent that the markets were anticipating events too rapidly. There was, accordingly, a complete change from yesterday, and nearly all the jobbers were sellers. Russian of 1873 fell nearly 2*l.*, to 86⅞; Egyptian of 1873 declined 1⅝, to 52; and all the other issues in proportion. Argentine of 1868 gave way 2*l.*, to 68. The railway market did not suffer so much, the principal change being a fall of 1¼ in Caledonian, to 126¼. Dover, A, lost ¾ (116¼ to 116½), and North British ⅝ (99⅜ to 99¾). Great Eastern closed 51⅜ to 51⅝; Great Western, 103⅞ to 104⅛; Sheffield, 74⅝ to 74⅞; and Midland, 128⅝ to 128⅞. Telegraph shares were rather firm. Indo-European rose 1*l.*, to 20½, and Direct Cable 7s. 6d., to 11¾. In mining shares West Tankerville again showed weakness, being offered at 1½. Pennerley dropped to 13s. Richmond was offered at 6¼, and Flagstaff at 3⅛. Alamillos, ⅛ to ¾. Almada, 6s. to 8s. Eberhardt, 8¾ to 9. Rookhope, 16s. to 18s. Van Consols, 2⅛ to 2⅝. East Van, 7¼ to 7⅝. Providence, 10s. to 20s. Wheal Grenville, ¾ to 1.

WEDNESDAY.—Operators were quite perplexed to-day to know what to do. Some were for buying, and some for selling, thus the markets went through two or three changes during official hours, but everything was flat at the close. Nothing was done in 1873 Egyptians up to 3 o'clock under 52¼, but after that in a very few minutes the price ran down 1 per cent. lower. Russian of the same year touched 87¼, but closed 86¾. A large business was done in Caledonian at 127, but towards the close there was a rapid fall to 126¼. North British lost ¾, and finished below 99. There was a similar decline in Dover, A, which closed 115½ to 115¾. Midland, 128⅝ to 128⅞. Sheffield, 74 to 74¼. Great Western, 103¾ to 104. American Railways went down. Illinois Central receded to 84⅝. The miscellaneous department was firm, Commercial Union Assurance being dealt in at 18½, Credit Foncier at 1 9-16ths, National Discount at 10½, Newfoundland Land at 9, and National Safe Deposit at 2⅛.

THURSDAY.—There were drawn at Paris last week over 8200 bonds of the Turkish Loan of 1873, and these now, to all intents and purposes, become worthless, being unsaleable. Drawings of bonds issued by a power like Turkey should certainly have ceased long ago. There is not the slightest chance of those drawn being paid off, but until now the holders of the 8000 and odd could at least have sold them for 13*l.* or so. The markets were again dull and spiritless. There was a fall of ⅛ in Consols at the opening, which led to large sales of railway stock, but when the fall was recovered prices showed a little more strength; it was only Brighton A, however, that could be called a firm market.

FRIDAY (*Opening*).—Caledonian stock is weaker, and offered at 125⅞; a fall of ⅜, but Midland is strong and in demand, at 129. The others show but little change. Russian, 85⅞ to 86⅛; Egyptian, 50¾ to 51. Some of the leading lead mines are still suffering from the failure of the Burry Port Smelting Company. Roman Gravels (12¾ to 13¼) is especially weak, from a fear that the dividend recently declared may be jeopardised. Only a week ago this mine sold to the above-named company 220 ton of ore, at prices varying from 14*l.* 10s. to 14*l.* 14s. per ton. Van shares are dull, at 36, from the same cause, while Assheton shares are not better than 1½ to 1¾, against 2 to 2¼, the price ruling last week. Eberhardt, 8¾ to 9; Richmond, 6 to 6¼; Javali, 8s. to 10s.; Flagstaff, 2¾ to 3¼; North Laxey, 15s. to 17s.; Rookhope, 16s. to 18s.; West Tankerville, 1½ to 1¾.—*Two o'Clock.*—Midland has receded to 129 sellers, while Caledonian has recovered to 125¼, 126. Birmingham, 147⅞ to 148½; North British, 98¾ to 98¾; Great Western, 103¾ to 104; Dover, A, 115½ to 115¾; Great Eastern, 51 to 51¼. Consols are 96⅛ to 96¼. Russian of 1873, 85⅝ to 85⅞; and Egyptian of the same year, 50⅛ to 50⅞.—*Four o'Clock.*—At a meeting held this afternoon it was decided to postpone the Roman Gravels dividend for two months. Shares are flat, and quoted 12½ to 13. A feature of to-day has been the rather heavy drop in Central Illinois shares. They close $45 to $46, against $48½ to $49½ last night. Flagstaff dull, at 3⅛. Midland, 128¾ to 129; Caledonian, 125⅜ to 125⅞; Great Eastern, 51¼ to 51⅜; Penstruthal, 9s. to 11s.; Great West Van, 7s. to 8s.

Birchin-lane, March 23. FERDINAND R. KIRK.

THE SUTRO TUNNEL.—First-rate work is being done in the Sutro Tunnel, and the progress now is very rapid. At the measurement on the 22d. ult. it was found that 101 ft. had been made during the week, the total length being 16,136 feet. About 91 in. of water is flowing from the tunnel. The new passenger cars, to carry 12 men each have been placed on the track. The flow of hot water continues. In an item on the work done in the tunnel the Independent says:—"The first week of the present month the header of the Sutro Tunnel was advanced 90 ft.; the second week 80 ft.; the third week, ending on the 22d inst., 101 ft. This looks as though the men who work in the header will receive a premium this month almost equally as large as last month, notwithstanding there being but 28 days to count on. This progress is unparalleled in the history of the Sutro Tunnel. The number of men at present working in the header directly and indirectly, is in the neighbourhood of 60. The manner and rate the work is prosecuted speaks well for Foreman Bluett, the shift bosses, and the miners in particular: 94 ft. per week driven through the heart of the mountain, where at times the rock is almost of adamantine hardness, by the number of men mentioned, shows that in the Sutro Tunnel are employed the hardest working miners on or in the neighbourhood of the Comstock."—*Mining and Scientific Press* (San Francisco, March 3).

The Master of the Rolls has made an order for winding up of the Aberbeeg Collieries Company (Limited), on the petition of a creditor.

A petition has been presented to the High Court of Justice for the winding up of the Railway Accident Mutual Assurance Company (Limited).

Mining Correspondence.

BRITISH MINES.

ABERDAUNANT.—S. Toy, March 22: Setting Report: The six men that are engaged in cutting down the new shaft have not yet finished their contract, but are making fair progress towards it. In the east part of the sett (Crowiwm) the cross-cut to drive towards the new lode, by six men and one boy, at 10*l.* 5*s.* per fathom, for the month, or to cut the lode. The forebreast still produces nice stones of barytes, with spots of lead and copper, and is discharging water freely.

BEDFORD UNITED.—W. Doidge W Phillips, March 22: The lode in the engine-shaft is 4 ft. wide, and worth 40*l.*, or 80*l.* per fathom for length of shaft (12 ft.) The lode in the 127 east has improved, being 2½ ft. wide, and worth 16*l.* per fm. In this level west the lode is worth 12*l.* per fathom. In the 115 east the lode is not quite so good, being at present worth 10*l.*, but we think it will improve again shortly; west at this level the lode is worth 12*l.* The lode in the 103 east is 3½ ft. wide, producing good stones of ore, and letting out water freely; a very strong and promising lode. West at this level the lode is at present small and poor. In the winze sinking in the bottom of this level the lode is worth 14*l.* per fathom. The stopes are producing on an average 9*l.* each.—South Lode: In the 47 east there is no change to notice. The prospects of the mine are very good.

BODIDRIS.—H. Hotchkiss, March 21: Setting report for the ensuing month:—The 60 yard level, to drive east on the main lode, by four men, for the month, at 9*l.* per fathom, the men to pay cost and deliver their stuff to surface; this end is of a very promising appearance, and the lode is becoming more defined; it contains more spar, and is spotted throughout with lead ore and blende. The cross-cut to drive south on cross course, to intersect Maes-y-Ywll lode, is re-let, to four men, at 5*l.* per fathom; no alteration here worthy of note. The 45 yard level, to drive east on main lode, by four men, for the month, at 8*l.* 5*s.* per fathom; this end is still in the tie or knot of ground, but there is a little ore and blende in the roof of the forebreast, which has the appearance of soon getting through this tie, and is coming into a profitable piece of ground again. In the bottom of the level we have also gone through the ore, leaving a productive lode going down for next level (the 60 fm. level). The rise in the back of this level is re-let to men, at 7*l.* 15*s.* per fathom; this rise is producing fair stuff for the dressing-floors. The 30, to drive east on the north portion of the lode, is re let at 8*l.* per fathom, to four men, for the month. Since we commenced driving this end again we have met with another joint coming from the north side of the level containing a nice rib of ore about ½ in. wide; this is a good indication of our near approach with the junction of the Craigog lode, and should we meet with it here in those measures, there is every probability of its turning out rich. The stope in back of this level, by two men, at 5*l.* per fathom; we have broken some very good stuff from this stope, and is looking much about the same. Dressing operations going on regularly.

CASHWELL.—John Peart, March 17: In rising in the south vein in scar limestone the vein is looking better; it is about 3 ft. wide, of nice mineral, and more ore. When worked it makes very good bouse, and as I said in my last report we have 20 fms. of this stratum laid open and ready for working. We have three headings working in this vein in slaty hazel. The one farthest east is soft, and easy to work. In the softness or broken places are some good pieces of solid ore, and as far as we can judge likely to continue up to the top of the sill. The other two headings in this stratum are raising part ore, but so far has not improved very much. The heading in the north vein in scar limestone has improved in width, and contains more ore; from the appearance of this vein at the forehead we may soon have good ore. The heading in this vein in slaty hazel still continues to raise a good deal of ore, not quite so rich as it was, but will average about 6 in. wide of solid ore in the 5 yards limestone, and still continues upwards. During the last month there has been no particular change to note.

CLEMENTINA.—W. Bennetts, March 20: We have taken down the lode in the engine-shaft to day, and I am glad to say that the lode has very much improved, and is now worth 15 cwts. of lead per fathom, and by its kindly appearance we may expect a greater improvement. In the 75 end south the lode is 2 ft. wide, worth ¼ ton of lead per fathom, and looks promising for an improvement.

COMBMARTIN.—C. H. Maunder, March 21: Harris's shaft is cleared, timbered, and ladders put down to the 28; after completing the shaft, we have cleared 1 fm. of the cross cut to the lode. By the appearance, we shall have about 2 fms. more to clear and timber, after which we think the level will be more secure for clearing the remainder to the lode. We are hastening on with all vigour to reach the lode within about a week, where we expect to find a good lode for silver-lead and blende. At the 15 west excellent progress has been made with the drivage; lode producing good quality silver-lead and blende.

CWMYSTWITH.—March 22: Setting Report: In Michell's level to drive west on the new lode the lode is 3 ft. wide, worth 15 cwts. of lead ore per fathom; a very nice kindly lode, and the ground favourable for driving. In a winze to sink under Michell's level west on the new lode the part of the lode as being taken down for 1 ft. wide is poor. In Michells's cross cut to drive north the ground still continues stiff for driving, but during the last few days the end has become rather damp, consequently we hope that we are getting near a change. In Michell's level to drive east on the new lode the lode is still 2 ft. wide, producing good saving work for dressing—a kindly end. In the 12 east on new lode the lode is 2 ft. wide and poor; suspended for the present as there is a great deal of attle in the level, and it is not convenient to get it off until we clear the ore stuff from the Rosa level. In the rise in the back of the Rosa level new lode the lode is 3 ft. wide, worth 10 cwts. of lead ore per fathom, or 15 cwts. per fathom for the length of the rise—9 feet. In Gill's upper level to drive east on the new lode the lode is 5 ft. wide, composed of clay slate and blende, with spots of lead ore; saving work, and kindly for an improvement. In the cross cut north in the 15 we have cut through the north part of the lode, which shows some spots of ore, although poor; at the same time it is worthy of a further trial, consequently we have set two men to open on it. In the cross-cut north on Kingside adit we have not seen anything of value. In a stope in the back of Level Fawr on the copper lode the lode is worth 12 cwts. of lead ore per cubic fathom. In a stope in the back of the 24 on the Kingside lode the lode is 3 ft. wide, worth 12 cwts. of lead ore per fathom, and kindly. There is a stope in the back of the 15 on the Kingside lode set in order to prove what the north branches will do at this point; evidently after the men have been opening on it for a month we shall be able to say if it is worth a further trial. In a stope in the back of Michell's level west on the new lode the lode is 2 ft. wide, worth 10 cwts. of lead ore per fathom. In a stope in the back of Michell's level west on the new lode the lode is 2 ft. wide, worth 10 cwts. of lead ore per fathom. The lode in Michell's level west is looking well; in fact, we are now opening good stoping ground, but cannot report anything of importance in any other part of the mine. All our machinery is in fair working, and the dressing is being pushed on as fast as possible.

DE BROKE.—J. Phillips, March 21: Wilson's engine-shaft is about 8½ fms. below the 35, spots of lead ore are being met with in sinking through the lode. The 35, driving in a south easterly direction, is worth from 7*l.* to 9*l.* per fathom, but improving in value and character; 3 fms. further driving here will get us under the winze below the 25; the lode in this winze is worth 12*l.* per fathom; its present depth is 3 fathoms. The stope in the back of the 35 is worth 14*l.* per fathom. The stope in the back of the 25 is producing 2 tons of lead ore per fm., and a rise from the stope at the junction produces 25 cwts. of lead ore per fathom. On Friday last we sampled 20 tons of ore, for sale on the 24th inst.

D'ERESBY MOUNT. IN.—W. Bennetts, March 20: In the deep adit level the former workers appear to have missed the lode about 5 fms. back from the end, and I have to-day begun to cross-cut to intersect it. According to the dialling we shall not have far to drive.

DENBIGHSHIRE CONSOLIDATED.—John Pryor, March 22: The driving of the 112 east is being continued with a full force of men, and I am pleased to say the lode is yielding saving stuff for the washing floor. We are proceeding with our examination of the Coed-y-fedw workings, and hope to reach the 80 yard level quickly. I had applications to work on tribute here, which will yield us profit. In the 112 west the north cross cut is letting out a considerable quantity of water, indicating our approach to the lode. In No. 1 rise we are making all the haste possible to get through to Parry's shaft; in the meantime we have suspended the driving west, also the No. 2 rise, until ventilation is secured.—Dressing Floors: The men are engaged preparing the ore that is on the bank.

DEVON GREAT CONSOLS.—J. Richards, March 23: Wheal Anna Maria: In Blackwell's shaft, sinking on the new south lode, the lode is 2 ft. wide, composed of gossan, capel, quartz, and mundic.—Engine shaft: In the 80, west of Jeffry's cross-cut, the lode is 18 in. wide, composed of capel and quartz.—Wheal Emma—Inclined Shaft: In Alford's cross cut south, at the 100 west, a branch has been met with in the present end, which is from 9 to 12 in. wide, composed of arsenical mundic, capel, spar, peach, and spots of copper ore; there are also veins of rich lead ore and quartz running north and south about this point.—New Shaft, New South Lode: In the 175 east the lode for the present is small; 2 ft. wide, worth 1 ton, or 2*l.* per fathom. In the 175 east, on the south part of the lode, the drivage been extended about 3 ft.; the lode at this point being 8 ft. wide, 5 ft. of which is being carried, in which is a branch on the north side worth 1 ton of ore, or 4*l.* per fathom, and on the south another branch of arsenical mundic from 9 to 12 inches wide, containing a little copper ore. In the 160 east the lode is large, and for the width carried (5 ft.) is worth 4 tons, or 12*l.* per fathom. In Gorrell's winze, sinking below the 150, 5 ft. of the lode is being carried, which is worth for the length of winze (9 ft., 6 to 7 tons of ore, or 25*l.* per fathom. In the 145 east the lode is 2½ ft. wide, worth 1 ton of ore, or 4*l.* per fathom. In Toy's winze, sinking in the bottom of the 145 east, 3 ft. of the lode is being carried, which is yielding for length of winze (9 ft.) 9 tons of ore, worth from 30*l.* to 40*l.* per fathom, with more lode of similar quality standing north. In Bickle's winze, sinking below the 130 west of Tregay's cross cut, the lode has improved, and is now worth from 4 tons to 5 tons, or from 12*l.* to 15*l.* per fathom. In the 105 east, and east of Kitto's cross cut, the lode is 2 ft. wide, worth 3 tons, or 10*l.* per fathom. Our sale on Thursday last (82 tons) realised 295*l.*

DUBBY SYKE.—W. Tallentire, March 16: We have now risen 2 fms. 3 ft; the vein is about as last week, 3 feet wide, with some very favourable looking red mineral. We have only one cheek of limestone yet; the other side plate. We are pushing the rise forward as fast as possible.—Shooting Box Level: This level is making good progress with driving; the ground is rather harder to drive—the vein about as usual.

EAST CHIVERTON.—R. Southey, March 22: Since my last we have drained the mine to the bottom, and the men have resumed the drivage of the different levels. In the bottom end (74) west of shaft, the lode is 3 ft. wide, composed of flookan, mundic, quartz, and producing good stones of silver-lead ore. I am very much pleased with the appearance of the lode, and I hope in a short distance further driving west, as we get under the lead-bearing ground gone down in the bottom of the 84, a regular leader instead of occasional stones of lead will be met with. We are continuing the cross cut south of engine-shaft at the 64; our object for doing so has been explained in previous reports. This end is being driven by six men, at 14*l.* per fathom. Our engine during the wet season has been driven fully 12 strokes (9 ft. stroke) per minute. I am pleased to say the water within the past month has considerably fallen off. All other points much the same as when last reported on.

GLASGOW CARADON CONSOLS.—W. Taylor, W. J. Taylor, March 20: The new shaft is now in full course of sinking below the 78, ground moderately favourable, but the lode disordered, which we expect for some little distance, being in the point of the horse; 78 east on south lode, worth 20*l.* per fathom, and easy for working, opening through the lode behind this end for stopes, worth full 30*l.* per fathom. In the middle level east the lode is still disordered, but in favourable ground, although not of much value; winze in the bottom of this level worth 20*l.* per fathom, winze on the north part worth 7*l.* per fathom. In the 52 east, on the caunter, about the same size as last reported, chiefly mundic, with good stones of ore. Arrol's lode, in the 65 east, is improved; worth 8*l.* per fathom, opening good tribute ground. The stopes and pitches throughout the mine are looking very well, and yielding about their usual quantities of ore.

GLENROY.—R. Rowe, March 23: I have no change to report anywhere to-day, the cross cuts and stopes and the north adit just as last reported.

GORSEDD AND MERLLYN CONSOLS.—W. Edwards, March 22: The sinking of the new pit is for the present complete, being 20 yards below the adit; the men are now driving east and west along the course of the lode. There is nice ore in both ends. In the western sump the lode is of a splendid character. In the eastern sump the men are trenching on the bottom, and going directly towards the shaft. The character of the lode is well maintained. There will be 20 tons of clean ore in the wash by Saturday, and another 10 tons on surface, so that we shall sample our second parcel of 50 tons at the next ticketing.

GREAT DYLIFFE.—Edward Rogers, March 14: Dyliffe Lode: At the 132, east of engine shaft, we are stoping the back of the level 6 ft. in height to improve the ventilation. The lode is worth 20*l.* per fathom. At this level west the men are stoping for the same purpose; the lode is worth 16*l.* per fathom. I intend pushing on these two ends again as soon as we are high enough to fix the stull. The 120 is driving west by the side of the lode. In the winze in the bottom of this level, east of the shaft, the lode is worth 16*l.* per fathom. The rise in the back of the 105 is worth 20*l.* per fathom. At the 60 driving east the lode is 2 ft. wide, producing some rich stones of lead ore. At the 40, driving east of boundary shaft, the lode is unproductive.

— E. Rogers, March 21: There is nothing new worth mentioning since I wrote you last. A setting report shall be sent you next week.

GREAT RETALLACK.—J. Harris, March 17: In the 20 cross cut through the lode, the lode if composed of a run of tough clay, with crystals of sulphur mundic thickly disseminated through it, but not in a sufficiently compact state to be of any value. The pitch at the 30 continues to yield good work for blende, and the tributers are making good wages.

GREEN HURTH.—W. Vipond, March 15: We have finished stoping on the branch west of No. 1 cross vein; these two men are at present filling up some empty ground with deads, and when done we shall begin on some of the other branches further west, which are similar to the one we have been working. The stope in No. 2 cross-vein is yielding better ore this week, worth 1¼ ton of ore per fathom. The stope on the east branch continues as usual. The men have got to driving on No. 3 cross-vein, but we have the turn rail to put in yet, when we get the work out. They have got some samples of ore from this to day—the first we have seen in this vein since cut by the east and west vein. In the rise on the new east and west vein I think we have got up to the black bed, which is close to the top of the lime stone; we have ore all the way up in this rise. In the upper part of the limestone the vein is from 6 to 15 in. wide, consisting of nice bouse work. The end going west in this vein is yielding samples of ore, but not to value. The working north is yielding very kindly looking bouse, and working to a profit. The weather has been very much against the dressing this week; we have done all we could at this under the circumstances. We have about a wagon of ore (7 tons 4 cwts.) ready.

HARWOOD.—W. Tallentire, March 16: We are making good progress in driving east. There is no alteration except more sparry backs or strings crossing the end, with sometimes glazes of lead in them. We are pushing forward as fast as possible.

HINGSTON DOWN CONSOLS.—James Richards, March 22: In sinking the engine shaft below the 160 an improvement has taken place, a branch of ore having been met with on the north wall of the lode; this branch is coming from the east of the shaft, and is about 15 in. wide, worth 3 tons, or 12*l.* per fathom, and promises further improvement.—Bailey's Shaft: In the 160 west the lode is 4 ft. wide, worth 3 tons of ore, or 12*l.* per fathom. In the 160, east of Nicholls' winze, driving towards the shaft, the lode continues worth 4 tons, or 15*l.* per fathom. In the 150 west, driving on the south part of the lode, the lode is improved, being now worth, being now worth 3 tons of ore, or 10*l.* per fathom, with strong indications of a further improvement. In the stope in the back of the 150 west the lode continues worth 6 tons of ore, or 18*l.* per fathom. Chynoweth's rise, in the back of the 140 west, is for the present suspended, and the men are stoping to the east thereof, where the lode is yielding 5 tons, or 20*l.* per fathom. The 120 west, on the south part of the lode, is gradually improving, and is now worth 2 tons of ore, or 8*l.* per fathom. In the 110 west, on the south part of the lode, the lode is also worth 2 tons, or 8*l.* per fathom. In the stope in the back of the 110 west the lode is yielding 8 tons, or 24*l.* per fathom. The pitches are without alteration.

HOLMBUSH.—H. Bennett, March 22: The branch which I referred to in my last week's report, which was discovered whilst driving south on the lead lode, continues much the same; it is about 2½ ft. wide, yielding good stones of copper, and letting out more water. The 50, 60, and 70 fm. levels on the flap jack lode are being cleared and secured, as is also Miller's shaft between the 60 and 70 fm levels. By these means we shall soon be enabled to send to surface a large quantity of stuff from the lode above referred to. All the other tutwork and tribute bargains remain without any material change. Next Saturday being our setting day a full report shall follow.

KINGSTON CONSOLS.—J. Chynoweth, March 22: The water is forking very satisfactorily, and I hope by the middle of next week we shall get into fork at the 40. Fair progress has been made in driving the 30 west; lode 4 ft. wide, producing saving work for lead and blende. I have set a tribute pitch in the back of the 30 at 8*l.* per ton—No. 1 lead, 4*l.* per ton; No. 2 lead, 1*l.* per ton; No. 1 blende, 2*l.* per ton. Obliged to suspend the 18 west for a short time, as the men are engaged dropping the lift and forking the water. All the different stopes at the back of the 18 worth their former value for lead and blende. Sampled to-day—No. 1, lead, computed, 8 tons; No. 2, lead, computed, 1¼ tons; No. 3, lead, computed, 2 tons; No. 1, blende, computed, 20 tons; No. 2, blende, computed, 20 tons, to be sold on March 29, when offers will be sent to London office.

LADYWELL.—A. Waters, March 22: The 132 south does not show much improvement as yet. We have had an increased flow of water out of the end of late, which indicates our proximity to the soft open lode and orey ground. In the adit south there is a fine looking lode, which is yielding good blue and white lead, and leaving productive ground in the back and bottom of the drivage as we go along. The dialling shows that the said end is going forward considerably out of the line of the lode seen in the two new shafts on the mountain, and a considerable bend must occur to make the adit end and shafts to meet. The probability is that two productive lodes will be found to exist here—time will prove the matter. The rise in the adit behind the end shows a fairly productive lode, which can be worked at a cheap rate. We have to-day sampled 20 tons of lead ore, for sale next week.

LOVELL (THE).—J. Prisk, E. Kemphorn, March 22: The new shaft sinking below the 20 is yielding richer tinstone than it has for some time past, and we are making fair progress in sinking. The lode in the Stack shaft is also improved, and getting more settled, producing low quality tinstone. All the stopes throughout the mine are looking much as usual, and things in general going on satisfactorily.

MARKE VALLEY.—Wm. George, James Stenlake, March 22: The lode in the 50 end, driving west, has continued to yield since our last report fully 3 tons of ore per fathom. In the 30 end west the lode has improved, and will at present yield fully ½ ton of good quality ore per fathom, with a most promising appearance, and we are very pleased to remark that the ground is also much more favourable for driving. We continue to open out good tribute ground in the 10 end west, where the lode will yield 1½ ton of ore per fathom. All other points without change worthy of remark.

MEDLYN MOOR.—Joseph Prisk, Charles Rowe, March 21: The following is a report of the mine in detail and the setting which took place on Saturday the 17th inst.:—No. 2 North Lode: The 27 is set to drive east, by six men, at 6*l.* per fathom; the lode here has been disordered for a fathom or two, but is now looking very much better, and improving daily; worth 5*l.* per fathom. The 27, to drive west of cross cut, by four men, at 6*l.* per fathom: lode opening tribute ground. A rise in the back of the same level, by six men, at 6*l.* per fathom; lode 2 ft. wide, worth 9*l.* per fathom. No 1 stope in the back of the 17, by four men, at 30*s.* per fathom; lode worth 5*l.* per fathom.—No. 1 North Lode: The 27, to drive east of shaft, by two men, at 4*l.* per fathom; lode 1 ft. wide, opening paying tin ground.—No. 1 South Lode: The 27, to drive west of shaft, by four men, at 5*l.* per fathom. In the last few days the lode in this end is very much improved, and is now worth 12*l.* per fathom. A rise in the back of this level, by two men, at 3*l.* 10*s.* per fathom; lode worth 5*l.* per fathom. The 17, to drive west of flat rod shaft, by six men, at 5*l.* per fathom; lode 2 ft. wide, worth 9*l.* per fathom. Three pitches to eight men at tributes varying from 10*s.* to 15*s.* in 1*l.* In the last four weeks the mine is generally improved, and our future prospects are exceedingly good.

MELLANEAR.—John Gilbert, March 21: The lode in the 30, west of the skip-shaft, is 2 ft. wide, and unproductive. The lode in the 50, west of shaft, is still producing good stones of copper ore, and looking very promising. The lode in the 67 is 4 ft. wide, and worth 4 tons of ore per fathom. The rise in the back of this level is worth 3 tons of ore per fathom. The rise in the back of the 78, west of shaft, is worth 3½ tons per fathom. The winze in the bottom of this level is worth 3 tons of ore per fathom. The lode in the 86, west of shaft, is looking a little better; now worth 3½ tons of ore per fathom. The lode in the 78, west of Gundry's shaft, is worth 3½ tons of ore per fathom. We have cut through the lode in the 70 cross cut, south of Gundry's shaft, and find it to be about 7 ft. wide; the men are now driving east on the south part of the lode, which is worth, for 4 ft. wide, 2½ tons of ore per fathom. As soon as there is room for two pares to work conveniently we shall commence to drive west of the cross cut in a lode of similar value. The lode is not yet intersected in the 60 cross-cut, south of shaft, which proves that the lode must be underlying a little more than where we have seen it in the levels below. We have connected the plunger lift at Gundry's, and shall resume the sinking of the shaft below the 78 on Monday next. All our machinery and pitwork are working well.

NEW CWM ELAN (Lead).—W. Goldsworthy, March 17: The engine-shaft is being sunk with all possible speed, and the lode in the bottom is maintaining its value—15 cwts. of lead and blende ores per fathom. The lode in 30 west end is presenting a most encouraging aspect for some thing good, which I expect will occur at an early date; present produce 20 cwts. of lead and blende ores per fathom. No. 1 stope, in back of the same level east, will produce 20 cwts. of lead and blende ores per fathom; No. 2 stope 15 cwts. of lead and blende ores per fathom; the stope on the north lode 10 cwts of lead per fathom; No. 1 stop', back of the 20 west, 17 cwts of lead and blende per fathom; No. 2 ditto 18 to 20 cwts. of lead and blende per fathom; and the stope in the same level east 15 cwts. of lead and blende per fathom. The dressing floors during the week have been going on without intermission. The weather is more favourable for surface work. The parcel of lead ore (12 tons) is at the railway station waiting instructions. There are 7 tons of blende in the bin on the mine.

NEW SOUTH MERLLYN.—R. Rowlands, March 22: I have no particular change to notice since my last. Our operations are presenting a most promising appearance.

NEW TYLLWYD.—J. Paull, March 22: The south lode in the 30, west of the cross-cut, is 2 ft. wide, composed of spar, clay-slate, carbonate of lime, and lead ore, but not in paying quantity as yet, at the same time I am happy to say it is gradually improving, water issuing freely from the present end. The south lode in the 20, east of the cross cut, is all the width of the end (5 ft.), and orey throughout; the lode is still standing in the south side, which I have ordered to be taken down at once so that we may know its size and value. There is nothing new in the 20 east, on middle lode, since last week; about 3 ft. of the lode not yet taken down. No lode taken down in the winze since last report. There appears to be a portion of the lode still in the south side, which shall all be cut through by next report day. One batch of tributers' ore is now clean, and it shall be weighed on Saturday next, and the others shall be got out as soon as possible. We have now fine weather for all surface work, which is now being pushed on with the utmost vigour. All the machinery in good order, and going well.

NORTH LAXEY.—John Sowden, March 20: There is a slight improvement in the shaft, having cut a little lead in the north end; the lode is increasing in size, now 3 ft. wide, and very open, with a strong feed of water coming from the south end, and washing out fine lead from the cavity. The stope north of the 131 winze is worth 1 ton of lead per fathom. The stope in the 50 rise is worth 15 cwt. per fathom.—South Ground: The stope below the 60 is worth 15 cwt. per fathom. The stope in roof of the 60 on west lode is worth 1 ton per fathom. The 50 roof stope is worth 1 ton per fathom. The stope in roof of the 40 is worth 15 cwt. per fathom. The weather is more favourable for surface operations, and we have a full supply of hands on the dressing floors, which will enable us to put in more lead than we have for the last two months past, and increase the samplings.

OOLA HILLS (Limerick).—John Phillips, March 20: According to your request I herewith beg to hand you my report of the work done preparatory to forking out the old mine:—Engine Shaft: We have fixed skye rod to the main rod in the engine-shaft, put in stays to carry same, and made all necessary connections, fixed bearers in position to carry the 8 in. pumps, and put everything in order in the shaft to commence dropping the pumps the moment they arrive on the mine, which will be in a week or ten days hence, as informed by the engineers. The engine will be ready to start to work in about a fortnight or three weeks after the engineers commence repairing the same, which I expect will be in a few days.—Surface: We have lined and strengthened the bottom of shear legs, the same being dovayed in the iron sockets at the bottom, and we have stayed up the same, and made it all secure. We have put in a new frame in the engine house to carry the holding down pulleys of the drawing machine. We have fixed a new screwing-stocks for any heavy work that may be required, and the smith has made some of the screw plates for same, so as to have them ready when required. We have completed the building of the heavy masonry wall on the outside of the reservoir, the same being about 50 ft. long, 16 ft. high, and averages about 3 ft. thick; this is to support the old wall, which was very much decayed after standing so many years exposed to wind and weather, and was not worth repairing; in fact, it was an impossibility to make it stand. We have also fixed the hatch, or outlet to the same, which is a very substantial job. We have partly removed the slime accumulated in the bottom, but as I had to remove the men for a time about other urgent work it still remains to be completed. This will not take long to do, and when done it will give the masons every opportunity to stanch the old wall on the inside with cement; when this is done I have no doubt but it will be a successful piece of work. The new winch has arrived on the mine, and it will be put in position forthwith. We have also cut a water course from the mine to carry away the waste water to the main leat, which is a long distance, besides other work too numerous to mention. You will see by the foregoing that we are getting on well with all necessary surface work, and we can begin our work in the shaft the moment we are supplied with materials, which I trust will be in a few days.

PARYS MOUNTAIN.—T. Mitchell, March 22: There is a little change taking place in the 90 south to-day, with some strong patches of sulphur showing, and the ground appears to be getting easier for driving. Some of the stopes are doing a little better, and yielding more ore. We have a favourable change in the weather this last day or two, and we have commenced driving ochre for the market.

PATELEY BRIDGE.—C. Williams, March 22: Since my last report the 55 east on Rake vein, has continually improved, particularly in the bottom part of the level, which has produced some excellent lead ore, and as the beds are deepening towards us we may fairly calculate upon having a productive vein up and down the forebreast in a few feet further driving; the ground is at present rather tight, which makes progress slow. The 30 west, on the same vein, is progressing favourable, the leading part on footwall is all saving work for dressing, worth from 7*l.* to 8*l.* per fathom for lead ore, and the vein altogether has a very promising appearance. The south cross cut in the 20 west, to cut Lumb vein, is showing signs of nearing the vein; the limestone is becoming more broken and jointy, with strings of spar and carbonate of lime, and I am daily expecting to cut into a good body of ore. The new vein behind the forebreast of this cross cut is looking exceedingly well, and producing fine quality ore for 8 or 9 ft. in width, worth at least 18*l.* per fathom; I am of opinion that we shall obtain a great quantity of ore from this point. The metal bargain in the top part of the bel in the 20 is producing 1 ton of ore per fathom. Fielding's vein in the roof over the north west drivage in the 20 is 3 ft. wide, and worth 15*l.* per fathom for lead ore. The Sun vein going east from bottom of new shaft, under Gilfield level, is improving, worth for lead ore about 17*l.* per fathom, and likely to increase in value very considerably. All our machinery is in fair state of repair.

PATTER SYKE.—J. Peart, March 17: Since reporting on this mine last month we have been driving the level on the west part of the vein—Clargile Head vein, and have had a little ore, but where we are driving has not been so productive the last few weeks as previously; the vein has improved in width, and contains more mineral, and may soon have a change for the better. We intend to drive a few more fathoms south, and then make a cross cut eastward from the level forehead, and prove the other two north and south veins lying off in that direction, and running nearly parallel with the Clargile Head vein; 6 fathoms will prove them both, and where worked some 12 fathoms back raised a good deal of lead ore. They appear to be strong veins, and the three all being so close together will be very likely to flat from one to the other in the scar limestone above.

PEDN-AN-DREA CONSOLIDATED.—Wm. Fridaux, John Pope, March 21: Sump: In the 140 east winze the lode is worth 35*l.* per fathom. In the 130 west end the lode is worth 18*l.* per fathom. Cardozo's: In the 100 west end the lode is worth 17*l.* per fathom. In the 90 west end the lode is worth 10*l.* per fathom. In the 90 west rise the lode is worth 70*l.* per fathom. In the 80 west end the lode is worth 8*l.* per fathom. In the 60 west end the lode is worth 10*l.* per fathom. In the 55 west end the lode is worth 20*l.* per fathom. In the 55 west rise the lode is worth 12*l.* per fathom. We sold on Wednesday last, the 14th inst., at Trethellan, 7 tons 12 cwts. 1 qr. 25 lbs. of black tin, at 45*l.* 10*s.* per ton—331*l.* 12*s.* 7*d.* Also on Thursday, the 15th inst., 7 tons 19 cwts. 2 qrs. 12 lbs. of black tin, at 43*l.* 10*s.* per ton—344*l.* 3*s.* No other changes to report.

PENNANT.—March 22: I am glad to say that the lode in the 90 yard east seems to be improving. I have this day broken there from fine lead ore, and the present end looks well. We shall be able to say more of this in a few days. This is one of the most important parts of the mine for the future. We have not taken down the lode in the winze at the bottom of the 60 level west this week, but the vein where pricked into seems to be good. In the 60 yards level east I think we have intersected one of the productive runs of ore passing down from the 40, which is likely to prove of great importance. We have a great quantity of barytes broken; and, for the present, the men engaged in these stopes are put to get ore. The machinery is in good order, and working well.

PENSILEY.—W. T. Harris, J. Delbridge, March 21: In driving the 45 west, on Wilson's lode, the ground has much improved for progress, and the lode is producing stones of lead weighing over 1 cwt., and promising for further improvement. This is the only change calling for remark. I will send you a full report next week. We have sampled to-day 10 tons blende ore, for sale on the 30th inst.

PERKINS BEACH.—F. R. Chesney, F. A. Codd, March 6: Having been requested by you to visit the mine and give you our opinion as to its present condition and future prospects, we have to day been through all the workings, and beg to inform you that the operations of this company have been carried on in a satisfactory manner during the short time that the property has been in its possession. Ore to the extent of about 4½ tons, which is reported as having been taken out during the last fortnight, is on the ground ready for sale, and we found in numerous places lead in a nearly pure state being taken out from the different ends. We are of opinion that the property is a very valuable one, and that, under judicious and economical management, it must become yet more valuable. From analogy it may be expected that as the sinkings go to a greater depth they will improve in richness of yield; and, like the adjoining mines of Smallcoach, Tincerville, and Roman Gravels, give ample dividends to the shareholders of the company.

PERKINS BEACH.—S. M. Ridge, March 17: Bowyer's sump, sinking by nine men, in pump sump; the lode below the adit level is now down 9 fms. 4 ft. For the last 2 fms. the lode has been poor for lead ore, and in a disordered state. I therefore advise to suspend the sinking here for the present, and to put these nine men to drive as follows:—Three men to drive north east upon the No. 2 counter lode at the 70 fm. level; four men to drive the 70 fm. level south west to cross Gwilliam's and Walker's lodes; two men to drive east out of the old pump sump. These are trials I consider highly worthy of being carried out forthwith, and can be done in the way I have advised with the same number of hands. In the 70, driving north east upon the No. 3 counter lode, by three men, we have a change of ground which I like much, and have this day broken some nice small stones of lead from the end; this looks quite likely for further improvement. The 70, driving east of engine shaft, by four men, continues much the same for driving, but we have a rib of lime spar coming in on the hanging wall of the lode about 4 in. wide, and some spots of lead in it looking kindly. The tribute pitches in Gwilliams lode below the adit level is not looking so well as it did a few days back, still there are some good stones of lead in it, and I fully expect this lode to improve as depth is obtained, especially at deeper levels to the west. I have got the boiler put in good order, and the engine and all else working well.

PLYNLIMMON.—John Garland, March 22: With the exception of Herbert's winze, sinking below the 24, striking a branch of the lode, which contains blende and lead ores, there is not any change calling for remark in any of the underground operations since my last. Against my next weekly report I hope to have met the lode in the two winzes, when I shall report progress and value. I have to day succeeded in borrowing a mason for a week to build a loading under pedlum bob; this work has been commenced to day. All other work at surface and below is being pushed on as fast as possible. Biddings for 20 tons of lead ore, samples of which were issued on the 20th, are due at the office on Tuesday next, the 27th current.

PRINCE OF WALES.—J. Andrews, J. Pryor, March 21: Having on Saturday last effected a communication between the 77 and 55, there is now a thorough ventilation in both levels, and we are now in a position to stope the ore ground in the back and bottom of the 55. The lode in the 55 west is 4 ft. wide, composed of quartz, capel, and roundie, and spotted throughout with yellow copper ore—a strong masterly looking lode.

RELISTIAN CONSOLS.—J. Curtis, March 22: In the 10 end the part of the lode we are now carrying is 4 ft. wide, with good stones of tin in it, and yellow copper ore, with a quantity of water coming from the south, and how much wider the lode is I cannot say. The winze sinking below the adit will be holed by Saturday next, which will ventilate this part of the mine, and open a large piece of tin ground. There is no material change in the tribute department.

ROMAN GRAVELS.—A. Waters, March 22: The 106, south of flat rod shaft, is worth 4 tons per fathom for lead ore. The winze below the 95, north of the said shaft, is worth 2 tons per fathom. The 95, south of new engine shaft, is worth 2 tons per fathom. The 80, south of said shaft, is worth 4 tons per fathom. The winze below the 65, south of Stokes', is worth 3 tons per fathom. The 65 south, on hanging wall and footwall parts of Roman lode, are worth 2 tons per fathom. All other points as of late.

SAINT PATRICK.—W. Francis, March 21: The 120 yards cross-cut north goes on speedily, the cross-course being 18 in. wide, composed of clay and a little spar. The 60 yard cross cut in the chert is a little tighter for driving, but the ground is very promising, and good progress is being made.

SOUTH ALE AND CAKES (St. Day).—J. Harper, March 22: The drivage of the north and south cross-cuts is pushed being on with vigour; the ground in the former shows the most favourable indication of the near proximity of the lode than I have ever seen it, the killas being of such a congenial character, and in the last 6 ft. driving occasional stones of mundic intermixed with water issuing freely therefrom is an evident fact in this district that there is every probability of a very productive lode when cut. In the south cross cut the ground is changed for the better, and from indications the lode is only about 2 fms. ahead of us (this is one of the Treasvean lodes), which we hope also to reach in the course of a few days. The lode in the eastern end is considerably changed in the last few days; it is increasing in size, producing copper and mundic, and as we are getting off from the influence of the cross course the lode improves for copper, and judging from the character of the ground I have every confidence that in course of a short time I shall have the pleasure of reporting a valuable discovery.

SOUTH CONDURROW.—Wm. Rich, Wm. Williams, H. Abraham, March 21: We set the new stamps-axle to work last Friday, which is doing well. We are now in full swing with the whole 80 heads of stamps working. We have to drive a short side level in the 63 to avoid the run on the cross-course caused when the

water was in; this side level will probably take two or three weeks before we can resume the 93 west. The 80 end east is worth 9l. per fathom. A winze in the bottom of this level west is worth 10l. per fathom. The 70 end west is worth 8l. per fathom. The rise in the back of the 70 is worth 12l. per fathom. The 60 west is worth 9l. per fathom. The rise in the back of the 60 is worth 11l. per fathom. The sink in the bottom of the 60 is worth 15l. per fathom. The 50, east of west cross cut, is worth 7l. per fathom. The 50 west is worth 10l. per fathom. The 50, east of King's shaft, is worth 10l. per fathom. The rise in the back of this level is worth 9l. per fathom. We have intersected the capels of the great lode in the 40 cross cut north of engine shaft; the ground is very hard, and it will take some time to cut through the lode. We hope to hole the rise in the back of the 40, east of new shaft, this week; when this is done it will open out profitable tin ground. We have completed cutting plat at the 10 fm. level Plantation shaft, and have set to sink the shaft below this level, as well as to drive the 10 cross cut north to intersect the north lode.

SOUTH DARREN.—H. James, A. Gundry, March 20: We have the 90 drained, and the men driving the forebreast; the lode is hard and massive. The full width we do not know, as it has not been cut through to the north wall. Value, so far as we have gone, 36l. per fathom. The stope in the back of the 90 is worth 8l. per fathom. The erection of the drawing machine is completed, and the skips have been sent down as far as the 80, and work well. We are now fixing rollers at the angles and finishing the lodges. All this will soon be completed, and the drawing commenced. The crushing mill is now being put in as fast as possible, and will shortly be ready for working.

SOUTH ROMAN GRAVELS.—J. W. Powning, March 22: Shelfield: I have set the cross cut in the 45 to drive north from the shaft towards the main lode, the month, at 15l. per fathom; about 5 ft. has been driven since my last report. The round is strong, but we expect a change for the better as we near the lode; I believe we have the lode in the 20 cross cut, west of the shaft, and have driven 5 ft. on its course, and find it gets wider and stronger as we advance. We shall see more of it in the course of a few days.

SOUTH TOLCARNE.—W. Rich, W. Hambly, March 21: We have a large promising lode in the 50 end east, which yields occasionally fine rocks of rich grey copper, and we hope it will soon lead to a good course of ore. We are urging on the end, by six men, as fast as possible. In the adit end east the north gossan lode carries fine stones of yellow copper ore. We have opened on the back of a large lode in the costean pits at surface, near the eastern boundary. From its position and general appearance, we consider this to be the South Condurrow great tin lode. It yields good stones of tin close up to surface.

TALYBONT.—Thomas Granville, March 19: No. 2 Lode: In the 17 east the lode is now about 18 inches wide, of a very promising character, and composed of quartz, lime, and lead ore. In the 17 west the lode is about 1 ft. wide, producing occasional stones of lead, and by its appearance we may shortly expect a great improvement. The stopes in the back of the 17 are yielding about 14l. worth of lead ore per fathom.—North and South Lode: In the upper level we are now engaged cutting out the western part of the lode, which is yielding about 1 ton of lead ore per fathom, with every indication of improving as we proceed. In the deep level driving north from the base of the river the lode at present is composed of lime and a mixture of lead ore, and I have no doubt that as we proceed further into the mountain we shall meet with lead in paying quantities.

TANKERVILLE.—Arthur Waters, March 22: There is no change worthy of notice here since my report of last week. Surface working going on regularly.

TEESDALE.—T. Watson, March 16: North End Workings: In No. 1 the men have cut some small strings, which show lead ore, but we see nothing of the main vein yet. In No. 2 six men are stoping out vein here, worth 12 cwts. of lead ore to the fathom.—South End: In No. 3 stope the vein has been very hard and poor this week at this working.—Hopkins's Level: We have a strong vein now in this forehead; the men sent out four wagons of bouse yesterday to the dressing floor.—Surface Work: The weather has been much against our surface operations this week. If the roads are open on Monday we will make a start to send away another truckload of lead ore.

TRELEIGH WOOD.—Edwin Hosking, William Goldsworthy, March 21: The lode in the 56, west of the engine shaft, is worth 9l. per fathom; is looking more kindly, and showing signs of improvement. The 56, east of the engine shaft, is being driven under the lode, that we may reach the cross course as soon as possible. The ground is favourable for driving. The lode in the 34 east is worth 8l. per fathom. There is no change in the 24, east of the engine shaft. The tributers are all at work, and the pitches are looking much the same as when last reported.

TRURO.—S. A. Ede: Since my last report we have made very favourable progress. For the last month I set the shaft at 7l. 10s. per fathom, the men to pay all cost with the exception of the whim charges; the ground sunk was 4 fathoms. I have set for this month at the same price and conditions, and from present appearance I believe they will get through equally as much ground in this; it having yesterday materially changed in their favour, the bottom of the shaft being now an intermixture of decomposed sandstone and clay, which strongly indicates our close proximity to the flat, the character of which I anticipate at an early date to acquaint you of. At the trial shaft nothing has been done since my last report, owing to the severity of the weather we have experienced. The dam continues to keep the shaft dry at the bottom, thus enabling us to sink at about twice the rate of formerly.

WEST CHIVERTON.—R. Southey, Wm. Roberts, J. Moyle, March 22: The lode in the 160, west of Batters' shaft, is 2½ ft. wide, worth for lead 10l. per fathom; this will also apply to the 160 end east of shaft. In the winze sinking below the 150, west of Batters' shaft, the lode is worth for lead 12l. per fm. The lode in the 150, east of Batters' shaft, is 3 ft. wide, and worth for lead and blende 8l. per fathom. In the 140, east of Hawke's shaft, the lode is 3½ ft. wide, worth for lead 12l. per fathom. We have just communicated Glubb's shaft to the 150, and shall have it completed for drawing purposes in about six weeks time. The lode in the 120, west of Burgess shaft, is 4 ft. wide, worth for lead and blende 20l. per fathom. The severity of the weather has somewhat impeded us in our dressing operations, but otherwise everything is progressing in a very satisfactory manner.

WEST GODOLPHIN.—John Pope, March 21: There is no change in the mine worthy of notice since my last information. We had to stop the engine this morning at 5 o'clock to repair the caps on the balance-rod in the engine shaft, which we discovered to be failing; the engine is gone to work again, after being idle for 7½ hours. The water this morning at 6 o'clock was 7 fms. 5 ft. 2 in. below the 50. I will send full report in time for the general meeting.

WEST GREAT WORK.—S. J. Reed, March 22: There is a further improvement in the lode at Duke's shaft, now 2 ft. wide, and worth 12l. to 14l. per fathom. This end (the 15) is close to the old workings, where it is said large quantities of tin have been returned; this end will come in underneath the old workings, and leave good backs at our disposal. In the 10 the lode has divided, and I have put the men to cross-cut south, where I think the main part of the lode is. There is no other change.

WEST MARIA AND FORTESCUE CONSOLS.—W. Skewis, March 21: North Lode: The lode in the 71 west has improved during the past week. The branches are larger, and contain more copper and mundic. I am looking for further improvement during the coming week. The stopes in the bottom of this level are worth 15l. per fathom. The stopes in the back are looking much the same as for some time past; worth for copper and mundic 20l. per fathom. The tribute department is looking favourable. The boring machine is working remarkably well, and the miners are highly pleased with it.

WEST TANKERVILLE.—Arthur Waters, March 22: We start to-morrow morning to draw the water out of the shaft below the 75, and calculate on resuming the sinking on Monday morning next. The 75, south of shaft, is worth 12l. per fathom. The stope in roof of said level is worth 15l. per fathom. The 63 fm. level, south of shaft, is worth 15l. per fathom. We have commenced a new winze in the 63, 15 fms. south of shaft, on a lode worth 12l. per fathom. No. 1 stope, in said level south, is worth 12l. per fathom. No. 2 stope is worth 15l. per fathom. No. 3 stope is worth 10l. per fathom. No. 1 stope, in the 50 south, is worth 28l. per fathom. No. 2 stope, in the 50 south, is worth 14l. per fathom. The stope in the said level, north of shaft, is worth 12l. per fathom.

WEST TRESAVEAN.—George Stephens, March 22: I am pleased to inform you that we have discovered tin in the elvan west of Michell's shaft. This was done in widening the level. In taking down the side of the level we cut into the level, and found a great many veins of tin, quite solid. This elvan is dropping into the south copper lode, and from its underlie or dip it will fall into the lode about 10 fms. below the present deep adit, when I think a large deposit of tin and copper will be found; and from present appearances large quantities can be raised from this level that will pay well. The north copper lode is 2 ft. wide, and we have taken out a sample from this lode which I estimate is 20 per cent. of copper. I send you sample of this lode, also the elvan that contains the rich branches of tin; this is quite a new feature in the mine, and in my opinion will lead to important results.

WEST WHEAL TOLGUS.—March 21: The ground in Taylor's shaft has been hard and troublesome for sinking in, consequently our progress has been slow; a floor of spar crossed the shaft, but we hope to get on better soon as the ground has improved under it. There has not been any of the lode taken down in the 135 fm. level end east since the last report. The lode in the 135 end west is not so good as last reported; the south part will yield 6 tons of good ore per fathom. The men are now taking down the north part, but no north wall has been seen yet; we can see it will yield 3 or 4 tons of ore per fathom, so it is all right thus far. The stopes in this level are yielding well up to the former reports. There will be changes in this level, but we are safe from this level to the 125; for the whole length driven through the four winzes shows it to be certain. The lode in the rise in the back of the 125 west is not rich, only yielding saving work. The lode in the 115 end west is 3 ft. wide, and poor. There has not been anything done in the 115, east from Michell's rise, on the south part of the lode, since last report, as the men are employed in stoping the back to prepare for putting a stull in to stope the old back, from which it will yield 3 tons of ore per fathom. Richard's shaft is nearly down deep enough for the 95 fm. level, and we shall begin to cut the plat next week; the lode is large and kindly, but not yielding much ore. There is no alteration in the ends in this shaft for some time past. The stope in the back of the 85 west is now yielding 3 tons of ore per fathom. We sampled yesterday 350 tons of ore—240 tons of adventurers' and 110 tons of tributers'; the adventurers' ore is of good produce, and the tributers' better than usual.

WHEAL CREBOR.—J. Andrews, March 20: The lode in the 120 east is 3 ft. wide, worth 10l. per fathom. There is no change in the 108 east. The lode in the stope in back of the 108 is 4 ft. wide, worth 20l. per fathom. The sinking of the winze by the side of the lode below the 108 is going on satisfactorily, and is now down 10 fms below the level. The lode in the 72 east continues large, but is unproductive. In the 48 east the lode is also large, but we are carrying only 2½ ft. of the south part, which is composed of quartz, capel, and mundic, and yields occasional good stones of mundic and yellow copper ore. The lode in the stope in the bottom of the 48 is 2½ ft. wide, and worth 12l. per fathom.

WHEAL KITTY (St. Agnes).—S. Davey, R. Harris, March 17: The points of operation are much the same as last week, consequently no changes to report.

WHEAL NEWTON.—H. Bennett, March 22: The two ends in the 40, driving east and west of Cook's shaft, continue to yield a fair quantity of good silver ore. The end east has somewhat improved within the last two or three days, and some rich silver ore was broken from the end yesterday. The stope in the back of this level is looking very well. All the other points of operation are just as when last reported on.

WHEAL PEEVOR.—W. J. White, J. Pryor, March 21: Setting Report: The shaftmen are at present engaged in fixing standing-lift from 60 to 70, which will be completed some time this month, when the sinking of the engine-shaft below the 70 will at once be resumed. The 70 to drive west of shaft, on south lode, by six men, at 7l. 10s. per fathom; lode full size of end, worth 25l. per fathom. No. 1 stope, in back of this level, by six men, at 3l. per fathom; lode worth 10l. per fm. No. 2 stope, in the back of this level, by six men, at 2l. 18s. per fathom; lode worth 12l. per fathom. The 60 to drive west of shaft, on south lode, by six men, at 5l. 10s. per fathom; lode 3½ ft. wide, worth 20l. per fathom. No. 1 stope, in back of this level, by four men, at 2l. 7s. 6d. per fathom; lode worth 15l. per fm. No. 2 stope, in the back of this level, by six men, at 2l. 10s. per fathom; lode worth 10l. per fathom. The winze to sink in the bottom of ditto, by six men, at 5l. 10s. per fathom; lode worth 20l. per fathom; this is a good point, being all in virgin ground about 6 fms. beyond the 70 end west before referred to. A cross cut to drive south of the south lode (on caunter), at the 60, west of shaft, by four men, at 1l. 10s. per fathom, and 10s. in 1l. tribute. The cross cut to drive south at the 48, to intersect the south lode, by six men, at 5l. 10s. per fathom. We also set 13 pitches on tribute to 48 men and boys, at tributes varying from 6s. 8d. to 12s. in 1l.

WHEAL PRUSSIA.—W. Tregay, March 21: West Shaft: The lode in the 30 west end will produce 15 cwts. of black tin per fathom; also in the stope below this level. We are unable to sink the shaft for the present, in consequence of the water not being yet sufficiently abated. We purpose pushing forward the 50 under this shaft with all speed.

WHEAL UNY.—W. Rich, M. Rogers, J. Rich, March 19: The rise in the back of the 60, west of incline shaft, is worth 7l. per fathom. The 130, east of King's, is worth 10l. per fathom. The lode in the rise above the 150, going towards King's shaft, is looking better, now worth 9l. per fathom. The 160 west is letting out water freely, and carries good stones of tin. We are sinking Hind's shaft below the 160 as fast as possible, but the progress is slow on account of the water.

FOREIGN MINES.

ST. JOHN DEL REY MINING COMPANY (Limited).—Advices received March 19, 1877, ex Neva (s.), dated Morro Velho, Feb. 17:—

PRODUCE FOR THE MONTH OF JANUARY.—The produce extracted during January has amounted to 33,447·0 oits. It has been derived as follows:—

	Oits.		Tons.		Oits. per ton.
From general mineral	14,352·9	from	3374	=	4·254
Mineral roughly freed from killas	16,529·6	,,	1996	=	8·281
	30,882·5	,,	5370	—	5·750
Re treatment	2,564·5	,,	—	—	·478
Total	33,447·0	,,	5370	—	6·228

= 3855·8950 ozs. troy = ·7178 oz. per ton.

The above shows a very low gold return for the month, the chief decrease in the produce being in the general mineral, the greater part of which has been taken from the western stope in the B section of the excavation. Although it is giving and may continue a little longer to give very small gold return, it would be unwise to leave the mineral standing, keeping in view the safe working of the mine.

COST AND PROFIT.

The produce being	33,447·0 oits.	
Deduct loss melting into bars	143·9 ,,	
	33,303·1, at 7s. 9d. per oit.	= £12,904 19 0¼
Cost		6,904 10 10¾
Profit for the month of January		£ 6,000 8 2

The cost is about 300l. less than was incurred in December, and the profit is quite as much as could be expected from the low produce extracted.

MINE DEPARTMENT.—The current fortnight has been a time of considerable anxiety, both as regards the water courses, the heavy penetration of the water from surface, and the consequent increase in the shafts and sump of the excavation; so far the water is in fork, and the pump is doing good duty.

The stoping has been carried on with considerable regularity, though a good many of the native miners absented themselves from duty during the very heavy nightly rains we have had.

The mineral raised and delivered on the spalling floors in 14 days amounts to 3594 wagons. Natives in attendance average daily 145·86; borers average daily, 95·57; duty per borer daily is equal to 2·61 wagons.

REDUCTION DEPARTMENT.—The breakage of the rego through which the water flows to these works at the amalgamation house caused a good deal of inconvenience and delay in getting the gold of the first division of the month prepared for the troop. The flooding of the house also occasioned much labour and extra work.

Some repairs have been effected to the Powle's stamping mill, and the stamps generally have been kept fairly at work. The supply of mineral received on the floors for the general stamps has been excessively poor, a light kind of empyritic killas prevailing in the general body, not having much auriferous material in either form or substance.

GOLD EXTRACTED TO DATE.—The produce from the mineral treated in the stamps during the first division of February, being a period of eight days, amounts to 6699·3 oits., having been derived as follows:—

	Oits.		Tons.		Oits. per ton.
From general mineral	2109·6	from	900	=	2·344
Mineral roughly freed from killas	4104·3	,,	512	=	8·016
	6213·8	,,	1412	=	4·400
Re treatment	485·4	,,	—	—	·344
Total	6699·3	,,	1412	—	4·744

Equal to .... 772·3199 ozs. = ·5469 oz. per ton.

This is very low produce, but is not inconsistent with the quality and character of the mineral received from the mine, as above described, during the first division of the month.

I am sorry to have to report the forwarding of such decreased gold returns, 10,000 oits. less than the previous month's remittance, the result of the large proportion of poor mineral raised, in the fair quarrying of the mineral lode in the western part of the excavation.

I have the honour to annex the usual fortnightly advice of general operations during the very trying period through which we have just been passing, and the effects of which still continue to cause very great anxiety. It is also with great regret I have to report such very low gold returns, which, however, is unavoidable from the quality of mineral being received—unless, indeed, we were to leave the proper stoping of the poor mineral in the western stope of the B section of the mine, which would not be desirable, and proceed to other places where better and richer mineral could be obtained. It is right and proper for the working of the mine that the poor mineral here referred to should be removed, for if left standing it would become a source of increased cost, insecurity, and might hereafter become dangerous to the future working of this section of the mine excavation.

GENERAL OPERATIONS.—During the past fortnight we have passed through a period of great trial and anxiety, which has been attended with considerable damage to the surface works and roads, some of the smaller water-courses, and a partial crush in No. 3 tunnel of the Cristaes, which deprived us for a short time of that valuable supply of water, and which was more decidedly cut off by a portion of the Salvador Hill, just at the north west corner of the blacks' burying ground, falling on and breaking the large launders close to the end of the tunnel through that hill, which conveys the water to the pumping and hauling wheel at the mouth of the mine, thus ultimately cutting off the supply of Cristaes water from the establishment. This breach was, however, repaired as rapidly as practicable, so that the water was only off the establishment about 5½ hours. The frequent and soaking rainfall in January, amounting in all to 12·43 in., had fallen in a period of 20 days, the 1st to 8th in succession, the 12th, 15th, and 16th, and the 18th to 26th each day inclusive, thus leaving the ground thoroughly saturated, causing many earth slips, obstructing roadways by the falling in of the banks and sides of the ridges and hills, and in many districts stopping all cart traffic. The ground was as it were prepared for the extraordinary and destructive rainfall from which we have so severely suffered since in February in this district of the Province of Minas Geraes.

We have had rain every day to date during the month of February. On five days of the smallest fall we had 2·18 in., on 11 remaining days to yesterday 23·13 in. (being more than 2 in. per diem); making a rainfall in the 16 consecutive days of 25·31 in. The average fall for a period of 22 years in the month of February has only amounted to 8·07 inches. These heavy rains have done immense damage nearly all over this mountainous and hilly district of the province, for although there are no very large valleys or flats in the water-sheds to admit of extensive floods, yet the fact of the small and large streams and rivers having a very great deal of current has caused the water to flow with enormous force, sweeping with it almost every obstacle with which it came in contact. A very large number of bridges have been completely carried away. The Rapozas bridge, within one league of Morro Velho, over which the company gets a large proportion of its present charcoal supply, and which had been reconstructed at the cost of the Provincial Government, has been swept away by the powerful current of the Rio das Velhas.

At Santa Rita, where there is a considerable flat space on one side of the river, a little above the level of the ordinary full current, the water rose up and covered part of the metalling of the bridge, which stands 22 ft. above the surface line on flat side, but fortunately, except the carrying away of part of the metalling of the bridge, resisted its force, and stood without having suffered any considerable damage. This bridge was re constructed by the company at the request and cost of the Provincial Government in 1858.

On the Paroepeba river, west of the Morro Velho, a new bridge just completed at a cost of about 3200l. by the Provincial Government, was completely broken and carried away by the torrents of that river. The damage done in all directions becomes painful to recapitulate. At the present moment roads are blocked up in all districts. Cart traffic is entirely suspended. Mules can only work on certain portions of the remaining roadways, and many cities, villages, and other inhabited districts are without the requisite supply of provisions.

In this respect, however, owing to previous good arrangements having been made, and having a good stock on hand of the essential supplies for the population, both in Morro Velho and at the store of Pereira Borges and Co., in Congonhas, the employes of the company and the inhabitants of the parish have not suffered, and I hope are not likely to suffer, inconvenience from the general want of provisions which prevails on almost every side around us.

To-day there seems a modification of the weather; less rain is falling, though the atmosphere is charged with much humidity. The barometers are rising, and there is reason to hope we have passed through the worst of this trying period.

The gold troop was dispatched from Morro Velho on Feb. 14, taking seven boxes, containing 20 bars of gold, weighing in all 29,870 oits. = 3443·5231 ozs. troy, *en route* for Rio de Janeiro, to be shipped per Royal mail steamer Neva, for Southampton and London.

The gold has duly arrived.

The following telegrams have been received:—

Feb. 21: "Produce for the month (January), 33,500 oits.; yield, 6·1 oits. per ton; produce small, from large temporary admixture of killas. Heavy rains have caused landslips, with considerable damage. Duty of stamps small from breakage of watercourse."

Feb. 26: "Produce eight days (first division of February), 6750 oits.; yield, 4·6 oits. per ton; profit for month (January), 6000l.; produce small, from large temporary admixture of killas and quartz."

March 6: "Produce 11 days (second division of February). 8·500 oits.; yield, 5·1 oits. per ton; produce small, from large temporary admixture of killas and quartz. All going on well."

March 17: "Produce for month (February), 23,500 oits.; yield, 5·1 oits. per ton; produce small, from large temporary admixture of quartz and killas. General work in the mine and on surface going on well, and satisfactory duty being performed."

— March 22 (Telegram): Produce, eight days, first division of March, 7750 oits., 3003l.; yield, 5·3 oits. per ton. Profit for the month of February 3000l. General work in mine and on surface going on well, and satisfactory duty being performed.

DON PEDRO NORTH DEL REY (Gold).—Report for January—Produce from 2226 tons, dry weight, 4327 oits. = 1838l. 19s. 6d.—Cost, including preparations for erecting permanent pumping machinery (labour and materials) and all general expenses), 2175l. 2s. 3d.—Telegram from Rio (March 11), referring to a later date than the above report, advised 3200 oits. for the month of February.

Capt. Vivian, under date Feb. 24, advises:—Mine: No. 7 Stope in No. 8 Shoot: This stope is the most northern portion worked on in the No. 8 shoot for some time past, the other part of the same shoot standing to the north of the stope referred to having been left behind, said to be too poor to work, but on resuming the No. 1 stope we find it to improve, therefore other stopes further north will be opened out as soon as possible, where I anticipate more improvement will be obtained, and not at all unlikely find some good stoping ground going west or uphill. I can see no reason why any part of this important shoot should be left standing, even if comparatively poor for a short distance; on the whole, it will, in any case, pay for working if operations be carried on on an extensive scale.—No. 7 Shoot: I am also anxious to see this shoot developed, which is standing intact to a great extent, and will inform you of the result as soon as able to carry out the arrangements proposed. We have had some very heavy and continual rain; happily no serious damage has occurred. The greatest drawback has been insufficient force, which I am glad to state during the last few days has somewhat increased, but not equal to our wants.

Feb. 24: The mineral has been extracted from Nos. 5, 6, and 8 shoots. General work is of fair quality. No boxwork available.—Stoping: Stoping operations being carried on satisfactorily, the force being more since the 19th. On the 21st we commenced another stope, south of No. 1 stope, on No. 5 shoot; also, on the same day, we resumed the No. 7 stope, in No. 8 shoot. This said stope is improved in quality. A driving has been driven north from Alice's level, and communicated to the No. 1 stope east, in No. 6 shoot.—Drainage: Water drawn from the mine is 22·50 cubic feet per minute. In consequence of the 11-in. lift of pumps having become very much worn, on the 18th we changed the said lift, and placed the 16 in. pumps on the 10 in. working barrel; this is connected with a short matching piece, made to fit the 10-in. working one end and the 16 in. pumps the other, which answer remarkably well. Changed brass of bob in Alice's; wheel idle 5½ hours. Water rose to 2 ft. in 35 fm. plat, but again put in fork on the following day. Re-opening of the incline-shaft being continued.—Prospective and Running Work: A force is being employed re-opening to 30 fm. cross-cut from the north part of No. 8 shoot to Vivian's shaft. A driving is also commenced to be driven north of the north cross cut. This will be driven to the canoa, and the old cross-cut will be refilled, as it is very expensive to keep open, in consequence of the stopes under. Nothing has been done towards Vivian's shaft for the last few days, the force removed to repair Alice's level.

— Telegram from Rio, dated March 22—Produce cleaned up (first division of March), 1450 oits.

RICHMOND CONSOLIDATED.—Telegram from the mine at Eureka, Nevada—Hall, London: Week's run, $56,000; week's produce of refinery, $32,000.

LONDON AND CALIFORNIA.—Telegram: Amador improved, some years' ore in sight.

JAVALI.—Capt. Sohns, Feb. 6: The mill driven by the steam-engine worked 23 days, and crushed 1250 tons of quartz, which yielded 351 ozs. of gold, averaging 5 dwts. 15 grs. The remittance is valued at 850l.; the cost was 810l. (including 94l. on capital account): leaving a balance of profit of 40l. Dry weather still continued.

CONDES OF CHILI.—Telegram dated Valparaiso, March 17: 16 tons of regulus and 35 tons of raw ore have been shipped per Britannia. Isolina Mine, Batters' (old workings) operations progressing satisfactorily. Completed the shaft to the bottom of the mine; lode in bottom averaging, estimated value, per ton (query per fathom) 100l. Isolina Mine, Dawson's (new workings) lode maintaining its value going down; estimated value 70l. per fathom.

OREGON.—Frank Ennis, Feb. 23: It commenced raining here on the 19th inst., and has continued to storm more or less each day up to present writing. We turned water into the Reed on the 20th, and are at present using 800 inches in this claim. I am running 1000 inches of water through the main ditch, 800 to Reed, as above stated, and 200 to Thoss, which, with what water there is in Thoss ditch, makes a head for that claim, some slides and caves on the ditches, but no breaks.

BLUE TENT.—D. T. Hughes, Feb. 24: We worked quite successfully this week in both Enterprise and South Yuba Mines, and also, as you will perceive by the report, done some washing at the Blue Lead. This claim we are trying to keep in order, and monitor set so as to enable us to use any surplus water, and prevent wasting any. The interruption in washing at Enterprise this week was caused principally in clearing up some sections of the flume. We have already commenced preparing, and will soon move our monitors down to the lower bench. We have opened our inner shaft successfully in the South Yuba, and fortunately without accident or a mishap, and are now piping on the bottom gravel once more. If this ground before us should prove as good as indicated before setting off our last blast, our next clean up certainly ought to be a favourable one. We had another break in our ditch this week, in a short flume between Alpha Road and Sardine Springs; the ground under the lower end of the flume gave way, breaking it down completely. It was promptly repaired again, and water running now to tent.

CEDAR CREEK.—T. B. Ludlum, Feb. 22: I last had this pleasure on Feb. 10, since when the weather has continued clear and dry. The water in our ditches has fallen off, so that we have now only about 2000 inches coming down. The following is a brief report of washing in the various claims:—Baker: We continued washing as constantly as circumstances would permit until the 15th inst., on which day we turned off and exploded the powder blast referred to in my last; it did good execution, loosening a large body of gravel, and, as I feared, covered our incline. We were not enabled to resume piping till Tuesday, the 20th inst., but are now under full headway, using water about eight hours per day, and are removing the gravel very rapidly.—Star and Union: In this claim we have been washing nights (part of the time), and removing the rocks during the day. In this manner we have nearly stripped all the rock and clay slide off the gravel lying on the point, and I am of the opinion that by Tuesday next we shall be ready to turn into the "pay." In my report on this claim I stated that about two weeks' "dead work" would be necessary. The time mentioned would not have been exceeded but for the scarcity of water, foreseeing that our supply was diminishing I have economised, and not washed therein as constantly as I would had our full head kept up; consequently, though I have accomplished the desired object, I have been longer doing it than I otherwise should have been. I have "great expectations" in a small way from this claim, as the gravel is reputed very rich. The Pacific continues washing day and night, and is now making good progress. The Central is running off and on as a waste water claim. The Gold Run has only been enabled to wash a portion of the time since my last. The tailings from the Pacific alone are not sufficient to clear the outlet. Our water customers continue using water as last reported. The Elmore Hill Company have changed the position of its pipe, so that it now uses 800 inches about 10 hours per day. I am crowding the work in every claim, trying to get them ready to clean up as soon as possible. The foreman of the Baker claim is off sick, consequently I am obliged to give that claim much personal attention.

CHONTALES.—Nov. 19: The directors have received advices from Mr. Danby, dated Feb. 5, who reports as following:—I am sending you by this mail 156 ozs. of gold, valued at $1450 = 290l. The cost for the past month has been, including payments for the freight of the new machinery, 409l.; estimated value of the gold, 290l.; showing a loss of 119l. The San Domingo mill worked very steadily during the past month, but owing to the want of water we were unable to run more than 16 heads and crush 530 tons, giving an average of 4 dwts. The pan was running about half the month, and treated a quarter of the concentrated sand produced from the mill. The want of water has been an unexpected drawback to us. The mines generally have been somewhat poorer than usual, especially Estrella. The new ventilation rise in San Sebastian is now through to surface on the back of the lode. There is an extensive gossan or manta, which from the samples I have taken appears to be payable. I have also given a man permission to work on tribute at the western portion of west San Benito. The present indications lead me to suppose and hope this will prove a valuable portion of this property, for I believe it to be the junction of San Antonio and east San Benito lodes, and I hope to crush some of the quartz from this place during the month, when I shall be in a position to report more fully.

EXCHEQUER.—Telegram received on Wednesday—Started mill and furnace on Saturday. All running well.—CHALMERS.

— L. Chalmers, Feb. 26: The foreman's report herewith contains all the information I can give you about the mine. We are all sanguine here.

— March 2: On Monday I wrote you that unless something happened to disappoint me the mill would run on that day week. Last night a violent storm swept away that part of the flume which crosses the creek, until that is rebuilt I cannot run. All hands will be on it to-morrow. To day I have men preparing a better foundation, but this takes the carpenters from the mill.

— Feb. 24: Foreman's Report: The 100 ft. stope (No. 2) was driven during the week 24 ft.; vein 3 ft. wide, 2 ft. of No. 1 pay ore, also 1 ft. of mixed, with good pay ore. The 200 ft. stope (No. 1) driven 16 ft.; vein 3 ft. 8 in., mixed with No. 1 pay ore. In the 300 ft. drift six sets of timber put in. At the 400 ft. drift three sets of timbers set in. One set in station and gyes to let the cage go down from the 300 to the 400. We will have no difficulty to keep the mill well supplied with ore.

I.X.L. (Gold and Silver).—Lewis Chalmers, Feb. 26: I hope to have the Exchequer hoister moved about Saturday. My foreman reports: The north drift is now in 486 ft. from cross-cut in the 200 ft. level, 12 ft. driven this week. There is not much change in the said drift since last report. The face is in solid quartz 4 ft. 9 in. thick, apparently medium ore, and is running 15° west of north. Ledge pitching 55° is looking well, and a considerable draining through the face. The rise is now up 125 ft. from drift; 10 ft. driven this week by three miners, and is in fine ledge matter, with occasional streaks of apparently good ore. There is some good ore in the face of the drain tunnel, south of rise. The drum is on the boiler, the new feed pump started, and working well. Everything in and about the mine is running and working well.

SAN PEDRO (Chili).—H. Phillips, Feb. 2: The shaft is down 15 fms. below the 150, and we yesterday commenced to drive the cross cut towards the manto at the 165, by four men, at $25 per metro. We shall sink another 5 metros in the shaft below the 165 for fork, and drive the cross-cut in a few metros before we can put down the skip road from the 150 to the bottom, we shall then put six men in the cross-cut, in order to advance as quickly as possible. The skip road cannot be put in at present, as we should be likely to break it in blasting in the shaft or cross-cut. In the 150 the cross-cut driving towards the Manto Verde is without change since last reported. As mentioned in my last, we have suspended the work in the 122 and 110 to husband our reserves for the 165. In the 47 the tribute pitch by the side of the old works is leaving a small profit, but the strings of metal are narrow. They have driven during the month 20 metros, at an average cost of $7·50 per metro. Everything, both at surface and underground, is working in a satisfactory manner.

PESTARENA UNITED (Gold).—March 19: District Val Toppa: The western part of the great quartz lode, in the end of Zero level, south of the third cross-cut west, has improved, and now yields 1 ton of ore to the fathom, that we estimate to be worth 15 dwts. of gold. The lode in the winze behind this end is yielding 7 tons to the fathom; and, judging from the last trial made, it is worth 15 dwts. of gold per ton. The lode in the end of intermediate level under zero is about 3 ft. wide, composed of quartz, at present of no value. In the end north we have a slight improvement. The great quartz lode in the intermediate end south, under No. 2, continues to yield 12 tons per fathom, worth 17 dwts. per ton.—Marmo Rosso Lode: In the end south of the first cross-cut east, in No. 2 level, the lode is of a promising appearance; and we hope to be able shortly to report of an improvement here. On the flat and new lodes there is no change in the end south on the caunter branch in Zero level.—Lode and Branches East of New Lode: The end south of fourth cross-cut in No. 2 level, on a flat lode, is yielding now 3 tons per fathom, worth about 9 dwts. of gold per ton. No change in the fourth cross-cut east in this level. In No. 3 level the lode in the end, north of cross-cut east, is poor at present.—District of Pestarena: There is a slight falling off in the size of the lode in the bottom of the new incline shaft. In the 90 end north we have an improvement in the size of the lode, which is now 3 ft. wide. The lode in the 90

end south is much the same as before, yielding about 1 ton to the fathom. The lode in the 80 end north is carrying more quartz. Nothing new to report in the 65 cross-cut west. The lode in the end of new drive south of this cross-cut, and 20 metres from No. 1 lode, is yielding 1 ton to the fathom, worth 1 oz. of gold. In the 55 north the lode is small, with stones of ore; this end bids fair for an improvement shortly.

Acquavite Department: The winze in the bottom of the 46 is yielding at present 1½ ton of ore per fathom, which we estimate to be worth 15 dwts. per ton. The lode in the 33 north continues to yield ½ ton to the fathom, worth 10 dwts. of gold per ton. Nothing new to report in the stopes. In the past two days the weather has become milder, and we shall resume to-day picking and preparing ore for the mills. The water in the Anza has increased a little, but not as yet sufficient for amalgamation.

The Mining Market: Prices of Metals, Ores, &c.

METAL MARKET—LONDON, MARCH 23, 1877.

IRON.	£ s. d.	£ s. d
Pig, GMB, f.o.b., Clyde..	2 13 9-	—
,, Scotch, all No. 1 ...	2 17 0- 3	5 0
Bars, Welsh, f.o.b. Wales	5 15 0- 6	0 0
,, ,, in London.	6 10 0- 6	12 6
,, Stafford., ,, .	7 15 0- 8	15 0
,, in Tyne or Tees ...	6 5 0- 6	7 6
,, Swedish, London ..10	10 0-11	0 0
Rails, Welsh, at works..	5 5 0- 5	10 0
Railway chairs	— -	—
,, spikes	— -	—
Sheets, Staff., in London	9 0 0- 9	5 0
Plates, Staff., in London	9 0 0-	—
Hoops, Staff.	7 15 0- 8	15 0
Nail rods, Staff. in Lon.	7 10 0- 8	0 0
STEEL.		
English, spring 14	0 0-23	0 0
,, cast 25	0 0-45	0 0
Swedish, keg.....17	0 0-	—
,, fag. ham. 17	10 0-18	10 0
LEAD.		
English, pig, common ..	5 0-21	10 0
,, ,, L.B. nom.	10 0-	—
,, ,, W.B. 22	5 0-	nom.
,, sheet and bar..22	10 0-22	12 6
,, pipe.....23	0 0-	—
,, red 23	10 0-	—
,, white 28	0 0-29	10 0
,, patent shot ..24	10 0-24	15 0
Spanish.....20	15 0 20	17 6
QUICKSILVER.		
Flasks of 75 lbs., ware. 7	5 0-	—
SPELTER.		
Silesian or Rhenish .. 20	10 0- 20	15 0
English, Swansea 22	10 0-	—
Sheet zinc 24	5 0- 26	0 0

TIN.	£ s. d.	£ s. d
English, ingot, f.o.b...	74 0 0- 75	0 0
,, bars ,, ...	75 0 0- 76	0 0
,, refined.....	77 10 0-	—
Australian	70 0 0-	—
Banca	73 0 0-	—
Straits	71 0 0-	—
COPPER.		
Tough cake and ingot.	76 0 0-	—
Best selected	77 0 0-	—
Sheets and sheathing .	81 0 0- 84	0 0
Flat Bottoms	86 0 0- 88	0 0
Wallaroo	77 0 0- 77	10 0
Burra, or P.C.C.	75 10 0- 76	0 0
Other brands	75 0 0- 76	0 0
Chili bars, g.o.b.....	70 10 0-	—
PHOSPHOR BRONZE.		
Bearing metal	£112	0 0
Other alloys £120	0 0- 140	0 0
BRASS.		
Wire	8½d.-9½d.	
Tubes.....	10½	- —
Sheets	9	- —
Yel. met. sheath. & sheets.	7	- 7¼
Nails composition.....	8¼	- 9¼

TIN-PLATES.*	per box.	
Charcoal, 1st quality...	1 2 6-	1 3 6
,, 2nd quality...	1 1 0-	1 1 6
Coke, 1st quality	0 19 6-	—
,, 2nd quality	0 18 6-	—
Black .....per ton	16 0 0- 16	10 0
Canada, Staff. or Gla., at Liverpool	12 0 0- 13	0 0
Black Taggers, 450 of 14 × 10	30 0 0-	—

* At the works, 1s. to 1s. 6d. per box less for ordinary; 10s. per ton less for Canada; IX 6s. per box more than IC quoted above, and add 6s. for each X. Terne-plates 2s. per box below tin-plates of similar brands.

REMARKS.—The more pacific tone of political intelligence generally in the earlier part of the week did not exercise the slightest influence upon our markets, and prices remained unimproved; and it is a most fortunate circumstance that it was so, as matters have since turned out, for buyers might have been misled, and committed themselves to engagements that they would be sorry for now. This prudent reserve is most commendable, for it has saved many from indulging in false hopes and entering into bad bargains at an exceptionally bad time, and prevented violent fluctuations in prices. The future is still enveloped in too much uncertainty to render it safe to enter into contracts of any magnitude, and it would be better for buyers to defer operating until matters fall into a more satisfactory and promising condition than to attempt a venture prematurely, which would, probably, only end in disappointment and loss. Our markets have fallen into such a miserably low state that it will be difficult to extricate them, and buyers would certainly not be induced to follow up any advance yet awhile, consequently speculation under existing circumstances is inopportune and unadvisable, since no advantage could be derived from it, and some amount of harm might possibly be done. Speculators should keep themselves unencumbered, so that when the right time comes they may be open and ready to aid in assisting the upward movement; but speculation alone will not answer. There must first be evidence of an increased home consumption before enhanced rates will be obtainable, and the shipping trade, instead of being on the decline, must undergo some amendment, with a good prospect of its continuance; but the fall in the value of silver does not warrant this expectation to be realised quickly, especially with regard to the Indian and China business, as there is almost a complete check on exports to these ports on account of the very serious fall in the rate of exchange.

The reverses in our markets are very great, and have now been going on for a very long period, and being continuous weighs heavily upon holders and importers, and as there is apparently no prospect of immediate improvement, but, on the other hand, a possibility of still lower prices ruling, their position is rendered extremely critical and unsafe. The mistake which many holders made in not realising before is perfectly evident to them; but even now they appear reluctant to cut their loss, and cling to the delusive hope of recovering former prices, and seem to prefer taking the risk of making additional losses to accepting current rates. Business this week has been restricted, and orders scarce for nearly all descriptions of metals; and the first spring month as yet has not presented any hopeful signs of a general resuscitation of trade.

COPPER.—This market still presents a doubtful aspect, and, notwithstanding that the sales of Wallaroo and Burra are over, there are no signs of improvement. The recent large sale of Chili bars in France has filled up that channel, and the English smelters are not inclined to buy at current rates; for they cannot sell tough at a profit to Birmingham, and the great fall in the Indian exchange prevents orders being given out for manufactured. The market may drag on for a little time longer at about current rates, and holders may rest satisfied if prices are not lowered, for the tendency is in that direction. The question may well be asked, Where is this demand to come from to absorb the superabundant stock? and at such a time, too, as the present. For, be it remembered that, although a large quantity of Chili and Australian has been sold lately, it simply amounts to a transfer, it has not yet gone into consumption, and it will take at least four months to do so, and during that time what is to become of the market? With France and India buying sparingly, or perhaps next to nothing at all, Birmingham still opposed to get into stock, the immediate prospects, indeed, are very discouraging, and the state of our market deplorably deficient. If the production in Australia, or Chili, or America were to diminish there might be some chance of recovery; but we fear this is very remote, and the average supply, at least, must be anticipated. If speculators were to come forward to the relief of the market, there might be a temporary rally; but as the market is not favourable for such operations, the support from such a quarter is very problematical.

At the public sales on Tuesday last 454 tons of Wallaroo cake sold from 76*l.* 15s. to 77*l.* 5s., or at an average of 77*l.* 0s. 7d. per ton, and 58 tons of ingots at 77*l.* 17s. 6d. to 78*l.* The 400 tons of Burra cake realised from 75*l.* to 76*l.* 5s., or an average of 75*l.* 7s. 8d. per ton. This can scarcely be considered a satisfactory result on the part of the Burra owners to sell their old brand of copper (which had a name many years before the Wallaroo was ever produced) *l.* 13s. below the value of Wallaroo, especially as after the sale of Wallaroo in February last large quantities of Burra were then sold at 76*l.* 10s. to 77*l.*, and there were sufficient orders in the markets at these prices to take the whole lot offered at the public sale on Tuesday last. We have, therefore, the following results:—Public sale average of Wallaroo Feb. 20 last, 77*l.* 6s. 10d.; private sale of Burra then, 76*l.* 10s. to 77*l.*, or (say) 6s. 10d. to 16s. 10d. per ton below Wallaroo, against a difference now of *l.* 13s. per ton, besides which, without the additional public sale of Burra, the value of Australian sorts altogether would probably not have reached so much. Respecting the public sales of Wallaroo, the auctioneers stated that they had since they began sold altogether 5510 tons of cakes and 1138 tons of ingots, at an average of 79*l.* 19s. 8d. per ton, which, including the last Tuesday's sale, is equal to a total of 71,600 tons of cakes and ingots, at an average of 79*l.* 15s. 7d. per ton, whilst we make the average of price of Wallaroo copper (cake only) from Jan. 1, 1876, to March 17, 1877, to be 82*l.* 14s. 2d. per ton, and the average price of g o.b. Chili bars during the same period 75*l.* 5s. 9d. The net result of the public sales of Wallaroo is, therefore, about 3*l.* per ton below the average market price of Wallaroo, and only about 4*l.* 10s. per ton above the average price of g.o.b. Chili bars. These facts speak for themselves, and show that it would be more conducive to the interest of the Australian companies to sell their copper privately as before, and not by forced public sales.

It was argued in favour of selling the Wallaroo copper by auction that it would attract consumers who would themselves buy in the sales, but it has signally failed in this respect, and only given rise to "bearing" operations, which were unknown before these public sales were announced; this is a cause of much regret, as our markets need no incentive to gambling transactions or occasions for appointment of Royal Commissions. Of the 7160 tons of Wallaroo sold in public sales only 530 tons, or scarcely more than 7 per cent., were bought in the name of consumers—In the first sale 270 tons of 2014 tons; in the second sale 125 tons of 1843 tons; in the third sale 35 tons of 1566 tons; in the fourth sale 40 tons of 610 tons; in the fifth sale 30 tons of 615 tons; and in the sixth sale 30 tons of 512 tons. This clearly shows how little interest those take in the sales whom it is considered by the sellers would be most interested, and that little interest which the novelty of the first sale or two seems to have excited is now fast dying out. So far, therefore, as consumers are concerned they have benefited indirectly, as these public sales have been the means of bringing the market down quicker and lower than it would otherwise have been, but this is not what the sellers expected, for instead of depressing prices they thought it would stimulate buyers to give higher prices. How much they have been disappointed—how dearly they have bought experience!

IRON.—The iron market is gradually working down to a lower level, both as regards pig and manufactured; and prices would not have been upheld so long had it not been for the arrangements existing between masters and men. The minimum rate of wages has been reached, and six months' notice is necessary before any alteration can be effected. This, we understand, the men received about a month ago from the Staffordshire ironmasters; therefore any reduction in prices during the next five months must be borne entirely by the ironmasters, and consequently there is no probability of the list-houses making any change at quarter-day. The whole trade has been shockingly managed from beginning to end; but the men, having the upper hand at one time, turned it as they thought to account, but which has proved equally detrimental to them as to the makers. They may certainly receive good wages for what work they do, yet if that amount of work is diminished in consequence of that rate of wage forming an impediment to effecting sales there is not much advantage in having it maintained.

A far more satisfactory state of things would be to have a full day's work, even at a less remunerative wage. Idle time is a great loss to the men, for they seldom turn it to proper account, and only spend more in drink. The reports from all parts are most discouraging, and there seems no chance of a revival for some considerable time to come; it will indeed be an agreeable surprise should it turn out otherwise. The shipments of Scotch pigs still compare very unfavourably with former periods, for the returns show from January 1 to March 17:—

1877	1876	1875	1874	1873
68,971	73,393	97,250	86,281	122,461 tons

Mixed numbers are now quoted 53s. 9d. cash, 54s. one month.

SHIPMENTS.

Week ending March 18, 1876 .....Tons	7,648
Week ending March 17, 1877	7,280
Decrease	368
Total decrease for 1877	4,701
Imports of Middlesborough pig-iron into Grangemouth:—	
Week ending March 17, 1877 .....Tons	6,360
Week ending March 18, 1876	4,740
Increase	1,620
Total increase for 1877	12,553

TIN.—A very quiet week has passed with this metal, and prices have remained extremely steady. There has been no attempt to unduly influence the future course of the market, either in one direction or the other, and the result is satisfactory, inasmuch that business could be transacted with a degree of safety. At a time like the present, when business has drifted into an unusually difficult state, and the features in connection with this metal are peculiarly strange, it needs all the strength of holders to preserve the stability of the market. Prices will drop until supplies or stock begin to show some reduction. Of that we may be certain, but any further decline in value will probably be gradual and very gentle, for the impression gains ground that at these low prices tin will be worth holding, and the advices from Penang support this view, but although higher prices are reported from the Straits, yet shipment continues to be made to this market, which is known to be below the price ruling there. The supplies of Australian, however, continue so large that there is not much chance for the market until they diminish, and the advices just received from Tasmania state that there is a large quantity being prepared for shipment. The deliveries from London this month are comparatively small up to date, whereas the arrivals are quite up to the average. At the end of the month statistics are, therefore, not unlikely to show an increasing stock, and should that be confirmed prices will again be lower. English has been sold as low as 74*l.*

TIN PLATES.—There is no improvement either in prices or demand, and some of the works experience a difficulty in obtaining orders sufficient to keep them going.

THE IRON TRADE—(Griffiths's Weekly Report).—Friday Evening. The Glasgow market for Scotch pig-iron has been quiet to-day, and closes with sellers of g.m.b. warrants at 53s. 9d., about 6d. less than the price this day week. We quote makers' No. 1 iron—Gartsherrie, 61s. 6d.; Coltness, 65s. 6d.; Calder, 62s. 6d.; Langloan, 62s.; Summerlee, 60s. 6d.; Monkland, 55s. 6d., f.o.b. Glasgow; Glengarnock, 59s. 6d.; Eglington, 56s., f.o.b. Ardrossan; Shotts, 62s. f.o.b. Leith; Kenniel, 56s. 6d. f.o.b. Bo'ness. Business in the iron trade this week is more circumscribed in this market. The price remains unchanged for all kinds of finished iron. Pig-iron is weaker at Middlesborough and Glasgow; at the former centre merchants are pressing iron on the market at figures under makers' prices, which undermines the stability of smelters' iron. On the Glasgow Exchange warrants are about 6d. per ton less than they were last week. The reports from all iron-making centres are discouraging. Want of orders, absence of profits and in many cases absolute loss by continuing the works, is reported from most districts, and, what is worse, it seems probable that we shall have no change for the better before Quarter-day. Other metals sympathise with iron. Tin and copper are very low in price, and the market shows no indication of permanent improvement. Whatever may be in the future for copper, block tin and spelter will both be lower before the end of April. We are sorry to have observed several failures in the iron trade this week; none, however, are of great magnitude.

The return of the acceptances given by a lead smelting company for lead ores purchased of different mines on the market—a thing totally unexpected, and of most unusual occurrence, ore bills having been always regarded as paper of the first class—has created an uneasy feeling in the MINING SHARE MARKET this week, and the quotations for lead mines, which have for months past been comparatively buoyant, have fallen in consequence, and now partake of the general depression. It is hoped, however, that some arrangements may be made so that the company referred to may be carried on and its engagements met; and it may be satisfactory, to a certain extent, to learn that most of the mining companies affected to any great amount are wealthy, and any inconvenience they may suffer will be only temporary: still, in times like these, the stoppage, or even diminution, of one dividend is not at all pleasant to contemplate.

At the Cornish Ticketing, on Thursday, the standard for copper ores remained without change. The average price per ton of ore obtained was 4*l.* 2s.

In TIN MINES, East Pool is quoted 10 to 10½; at the meeting, on Monday, the accounts showed a profit on three months' working of 608*l.*, and a dividend of 2s. per share was declared. The ores, credited were—copper, 1142; tin, 3447; tinstone, 2440; arsenic 755*l.* The costs charged to the end of December only were 4634*l.* The report states that the shaft is now down 7½ fms. below the 180. West Basset, 3½ to 4; the points in operation here are valued in the aggregate at 135*l.* per fathom, not including stopes. Carn Brea, 35 to 37; Dalcoath, 35 to 37; South Condurrow, 7 to 7½; South Crofty, 14 to 16; Tincroft, 18½ to 19½; Wheal Agar, 3½ to 3¾; Wheal Grenville shares have been in request, and advanced to 20s., 25s.; Wheal Kitty St. Agnes, 2 to 2½; Wheal Uny, 1¾ to 2; Relistian Consols, ½ to ⅝; a winze will be communicated with the adit next week, which will give ventilation, and open out a large piece of tin ground. The mine has sold a small parcel of tin at 42*l.* per ton, and copper at 6*l.* Wheal Coates, 1½ to 2; the lode sinking below the 50, is worth 17*l.* per fathom. The lode in the 50 west is worth 18*l.* per fathom.

Among COPPER MINES Devon Great Consols are 3½ to 4; there are veins of rich lead ore and quartz crossing Alfred's cross-cut south at the 100. The monthly sales of copper ore on Thursday realised 295*l.* Cathedral, 1 to 1½. Hingston Down, 10s. to 15s.; the sale of ore on Thursday realised 59*l.* Bedford United, 10s. to 15s.; the sale here realised for 156 tons 65*l.* 16s., without carriage. West Seton, 30 to 35; the 150 end has improved for copper, and now worth 8 tons of ore per fathom, at 4*l.* 10s. per ton. West Tolgus, 60 to 62½. Wheal Crebor, 2½ to 3; the lode in the 120 east is worth 10*l.* per fathom. The stope in back of the 108 is worth 20*l.* per fm. Prince of Wales, 3s. to 4s.; a communication has been effected between the 55 and 77 fm. levels, and the ore ground between them will now be stoped away. Parys Mountain, 7s. 6d. to 10s.; there is an improved appearance in the 60 cross cut south, and the stopes are yielding more ore. East Caradon, ⅞ to 1; the sales of copper ore on Thursday realised 45*l.* Marke Valley, ⅞ to 1½; the sale here, 330 tons of copper ore, realised 107*l.* 10s. Penstruthal, 10s. to 12s. 6d.; at the meeting in Cornwall the accounts showed a profit on the ore raised of 110*l.*, and it was stated that if tin had kept at the price it was at when the mine started it would have paid good dividends. The report of the mine, now worked principally for copper, was considered very satisfactory.

LEAD MINES have been dull, and prices generally have declined, for the reasons before stated. The mines chiefly affected, we understand, are—Van, Roman Gravels, Great Dyliffe, Great Laxey, Old Treburget, Grogwinion, Frank Mills, West Chiverton, Pennerley, West Tankeruille, Wye Valley, De Broke, Monydd Gorddu, Assheton, Ladywell, &c.

Van declined to 36, 38. Roman Gravels, 12⅞ to 13½; the dividend here, we are informed, will be deferred for two months. The lode in the 106, south of flat rod shaft, is worth 4 tons per fathom; the 95 south, 2 tons. Tankerville, 8½ to 9; West Tankerville, 1⅜ to 1½; Great Laxey, 20 to 21. North Laxey, 15s. to 17s. 6d.; the mine looks well, and likely to increase its samplings. At the Herodsfoot meeting the accounts showed a profit on the four months' working of 1*l.* 12s. 7d. The lead ores sold—122 tons—realised 187*l.* The balance of assets over liabilities, 150*l.* Glenroy, 1⅜ to 1⅝; a telegram received on Friday states there is no change to report anywhere; the cross-cut and stopes and north adit are just as last reported. Aberdaunant, 10s. to 12s. 6d.; Assheton, 1⅜ to 2; Cargill, 4½ to 5; East Van, 7 to 7½; Glyn, 1⅞ to 2.

Clementina, 35 to 45; the shaft has improved to 15 cwts. of lead ores per fathom. The 25 end is worth 10 cwts. D'Eresby, 20 to 22. South Roman Gravels, ½ to ⅝; the shaft having been sunk to the 45, a cross-cut has now been set to cut the lode at this depth. In the 20 cross-cut the lode is getting wider and stronger as the level advances. Combmartin, ½ to ⅝; the lode is expected to be seen at the 28 fm. level in about a week. At the 15 it produces good quality silver-lead and blende. Leadhills, 6 to 6½; Pateley Bridge, 2½ to 2¾; Van Consols, 2⅝ to 2⅞; West Chiverton, 18 to 19; West Craven Moor, 12½ to 13½. Gorsedd and Merllyn, 4½ to 5; this mine will sell a second parcel of 50 tons at next sale. Pennant, 5½ to 6; Llanrwst, 1½ to 2; Rookhope, 16s. to 18s.; Grogwinion, 4½ to 5; ditto (new), 2 to 2½; Wye Valley, 4⅜ to 5¼; West Wye Valley, 3½ to 3⅝; South Cwymstwith, 3½ to 3⅞; Red Rock, 2½ to 3⅞; St. Harmon, 3 to 3½; West Goginan, ¼ to ⅜; ditto (preference), par to ¼ prem.

FOREIGN MINES.—Argentine, 5 to 5¼. Chontales, 6s. to 8s.; the advices show a return of 106 ozs. of gold, value at 230*l.*, against costs 409*l.*, loss 119*l.* A great drawback has been the want of water. Javali, 8s. to 10s.; the returns, 351 ozs. of gold, estimated at 850*l.*, against a cost of 810*l.*, leaves a profit of 40*l.* Here also the dry weather has had its effects. Condes of Chili, 4¾ to 5¼; a telegram has been received announcing a great improvement in Buller's shaft, the lode is worth 100*l.* per fathom. Blue Tent, 3 to 3¼; Almada, 7s. to 9s.; Cedar Creek, ½ to ¾; Don Pedro, 9s. to 11s; Eberhardt and Aurora, 8⅜ to 8¾; Exchequer, 1⅞ to 2; Flagstaff, 3 to 3¼; Fromtino and Bolivia, 1½ to 1⅝; I.X.L., 17s. 6d. to 20s; New Zealand Kapanga, 2 to 2½; Last Chance, ½ to ⅝; New Quebrada, 4 to 4½; Port Phillip, 10s. to 12s.; Richmond, 6 to 6½; St. John del Rey, 270 to 300; San Pedro, 15s. to 20s.; Santa Barbara, 2½ to 2⅝; Tecoma, ⅜ to ½.

The Market for Mine Shares on the Stock Exchange during the week has been generally inanimate, although some departments have shown slight activity. The business, however, continues upon a restricted scale, transactions being insufficient to raise quotations from the present low level, but many considerations lead to the hope that after the holidays there may be a better and more extended market in all departments. The action of the House of Commons in directing an enquiry into the origin, history, and practices of the Stock Exchange is one upon which capitalists generally may well be congratulated. There are, probably, few public bodies in existence, at least in this country, in connection with which the most sweeping reforms are urgently required. It has become almost a proverb that the more questionable the project the more readily a quotation is secured upon the Stock Exchange, the admission to or rejection of an enterprise from quotation in the official list depending almost entirely upon the promotion of the concern being or not being in the control of particular members, and those, too, not the most highly respected. It is, however, gratifying to find that the majority of the more responsible members court the enquiry ordered, and are prepared to render the Commission every assistance in their power, feeling that the compulsory introduction of much needed reforms, which will have the effect of expelling, perhaps, one-fourth of the present members, will greatly strengthen the Exchange, and prove of inestimable advantage to the public. The more respectable of the members feel that Sir E. Watkin's prediction that the institution will come out of the ordeal as silver purified in the fire, will be realised, although a large quantity of dross will necessarily be removed in the process. May the reformed Stock Exchange be indeed an aid to legitimate enterprise, and a protection to capitalists and investors. With regard to new undertakings it is rumoured that some Levantine adventurers and speculators in London are about introducing to the public a new project for importing iron ore from some of the islands in the Levant, and are at present endeavouring to negociate the acquirement of some exhausted iron workings, the quality of the ore certainly not being better than the Spanish. Should the project be brought before the public as a lucrative and important investment the strictest enquiry should be made as to the unquestionable position, veracity, and practical knowledge of those concerned. It will also behove the person who owns such property in that country to seek the requisite capital at home, as there have been, unfortunately for our credit, too many unpleasant revelations in regard to such matters of late, and it will be desirable that extra precautions are taken in regard to antecedents and references before treating. It is said that in one case no less than four times the sum that would have been taken some six months since has been offered for a certain mining concession which is practically valueless. Especial caution should be exercised with regard to all properties offered by syndicates, however temptingly they may be set forth, more particularly after the late disclosures which have been made in such matters.

St. John del Rey, 250 to 300; the last telegram received to night gives the profit for February at 3000*l.* The general work in the mine and on surface is going on well, and satisfactory duty is being performed. The produce for the first division of March (eight days) was 7750 oits., of the value of 300*l.*, the ley of the ore being 5·3 oits. per ton. The produce for February was 23,500 oits., and the ley 5·1 oits. per ton. With reference to the continued low produce the advices state that the superintendent greatly regrets such very low gold returns, which, however, is unavoidable from the quality of the mineral being received—unless, indeed, we were to leave the proper stoping of the poor mineral in the western stope of the B section of the mine, which would not be desirable, and proceed to other places where better and richer mineral could be obtained. It is right and proper for the working of the mine that the poor mineral here referred to should be removed, for if left standing it would become a source of increased cost, insecurity, and might hereafter become dangerous to the future working of this section of the mine excavation.

Argentine, 5 to 5¼; from the latest accounts the sinking of the Pique shaft was being successfully prosecuted, and the mines generally were reported as looking exceedingly well. The report of Mr. Oxland is expected at an early date. Condes, 4¾ to 5¼; the lode in Dawson's workings is valued at 70*l.* per fathom, and in the deep shaft at 100*l.* per fathom. The agent expects to intersect one of the lodes in the deep adit in a few fathoms further driving. The appearance of the rock is favourable to its being cut rich.

Emma, ⅜ to ½; the directors have issued a further report of progress of their action in New York against Messrs. Park and Baxter. The directors consider the progress of the case is most satisfactory, and that there are good grounds for expecting a verdict for very heavy damages. The directors cannot fix definitely how much longer the trial will last; and, indeed, the shareholders will be able to form an equally good judgment upon that point themselves. The directors, acting on the telegram that "the case would last till the middle of March," fixed 5000*l.* as the sum they would require for the necessary expenses, and in accordance with a resolution of the special general meetings resolved to issue sufficient debentures to produce that sum. The whole of these debentures have, however, not been subscribed for, and, of course, as the trial is lasting so much longer than was anticipated it is very probable that the directors may require more than the 5000*l.* they had considered sufficient to carry on the case up till the middle of March. The debentures are issued at 75 per cent discount, so that the 5 per cent. interest is explained to be equal to 20 per cent. on the subscription price. Should the verdict be in favour of the company it will, of course, be appealed from, but the directors point out that in the event of an appeal from the verdict the defendants will have to lodge security in Court for the amount of the verdict, pending the hearing of any such appeal.

Richmond, 6 to 6½; the usual weekly telegram states the week's run at $56,000. The refinery this week has produced doré bars to the value of $32,000. Nothing further has been heard as to the progress of suits. The Eureka Sentinel of Feb. 24 quotes from the *Mining Journal* statements of shareholders commenting on depression in price of shares, and remarks: "As to the merits of the pending litigation between the Eureka Consolidated and the Richmond Companies we have no opinion to express, but can safely assert that the present condition of the mine warrants an advance of prices rather than a falling off. Immense bodies of ore are in sight, and

the prospects of the company were never more flattering. No report from the manager has reached the London office this week. Exchequer, 1¾ to 2: the depreciation in these shares has given place to greater activity. Upon the receipt of a telegram from the manager that the mill and furnace were started on March 17, and were running well. There were said to be large orders in the market which could not be transacted at the current quotations, some of the leading operators being reluctant to name a selling price. The latest advices state that the mines continue to open out well, and the underground agent reports that the mill can without any difficulty be kept constantly supplied with ore.

I.X.L., ¾ to 1¼; sympathetically with the advance in Exchequer, these shares have met with enquiry. The mine is opening out well, and the mill is expected to be in complete working order by Midsummer. Eberhardt and Aurora, 8⅝ to 8¾; there is nothing new to report. Flagstaff, 3 to 3¼; the latest advices state that the mine is fully maintaining its productiveness, and it is stated that arrangements are making satisfactory progress by which the property will be entirely disencumbered from every burden. Colorado Terrible, 1½ to 1¾; the result of the special meeting on March 9 was telegraphed to the agent, who replied that work upon the mine was resumed on March 10; as soon as the mine is unwatered the rich body of ore standing in the 6th and 7th levels when work was suspended two years ago will become available. The prospect of a settlement, and the resumption of mining operations in the Terrible Mine, is made the subject of much congratulation in local newspapers.

The market for Hydraulic Mine shares has been inanimate, with but few transactions recorded. Blue Tent, 3 to 3¼; the advices this week report continuous washing at both the Enterprise and South Yuba claims. At the latter the manager had been enabled again to attach the bottom gravel. Oregon (preference), 4 to 4¼; the superintendent has apparently been able to wash without interruption from Feb. 19. Cedar Creek, ½ to ¾; from the superintendent's report it will be seen that steady washing had been carried on to date of his letters.

Lead Mines have been without special change. Van, 35 to 37½; the annual meeting was held on Tuesday, and a detailed report appears in another column. The manager's report and statement gave much satisfaction to those present. The mine is looking very well. Pennerley, ⅝ to ¾; the only change reported is that the 45 fm. level, on Wilson's lode, has much improved, producing good stones of lead ore, and very promising for further improvement. Pateley Bridge, 2 to 2½; the agent's report, in another column, is encouraging; it shows that the mine is improving. The 20 east, on Rake vein, is looking better, while west the agent values the end at 7*l.* to 8*l.* per fathom for lead ore. The new vein in the 30 west, in the south cross-cut, is producing well, and is worth at least 18*l.* per fathom. The Sun vein is worth 17*l.* per fathom, and other parts opening up in a very encouraging manner.

Subjoined are the closing quotations:—

Assheton, 1¼ to 2¼; Carn Brea, 34 to 36; Devon Great Consols, 3¼ to 4¼; Dolcoath, 35 to 37; East Caradon, ⅞ to 1; East Van, 7 to 7½; Glyn, 1¼ to 2; Great Laxey, 19 to 21; Great West Van, ¼ to ½; Hingston Down Consols, ⅜ to ⅞; Lealhills, 6 to 6½; Marke Valley, ⅞ to 1; Parys Mountain, ¼ to ½; Pateley Bridge, 2 to 2½; Pennerley, ⅝ to ¾; Penstruthal, ⅛ to ¼; Roman Gravels, 12¼ to 13¼; Tankerville, 8 to 8½; Tincroft, 18 to 20; Van, 35 to 37½; Van Consols, 2¼ to 2¼; West Assheton, ¼ to 1; West Wheal Basset, 4 to 5; West Chiverton, 17 to 19; West Tankerville, 1¼ to 1¼; Wheal Crebor, 2¼ to 2¼; Wheal Grenville, 1 to 1¼; Almada and Tirito, 5 16ths to 7 16ths; Argentine, 5 to 5½; Birdseye Creek, ⅝ to ¾; Blue Tent, 3 to 3¼; Cape Copper, 40 to 42; Chontales, ¼ to ½; Colorado Terrible, 1¼ to 2; Condes of Chili, 4½ to 5¼; Don Pedro, ½ to ½; Eberhardt and Aurora, 8⅝ to 8¾; Emma, ¼ to ½; Exchequer, 1¾ to 2⅛; I.X.L., ⅞ to 1; Flagstaff, 3 to 3¼; Frontino, 1⅛ to 1⅜; Javali, ⅜ to ½; Kapanga, 2 to 2½; Last Chance, ¼ to ¾; Malpaso, ½ to ½; Malabar, ⅛ to ⅜; New Pacific, ¼ to ½; New Quebrada, 4⅛ to 4⅜; Pestarena, ⅛ to ¾; Plumas Eureka, 2¼ to 3; Rica, ⅛ to ¼; Richmond Consolidated, 6 to 6¼; St. John del Rey, 290 to 300; San Pedro, ¼ to 1; Sierra Buttes, 1¼ to 2; South Aurora, ¼ to ½; Tecoma, ¼ to ½; United Mexican, 2¼ to 2½; Cedar Creek, ⅛ to ¼.

COLLIERIES.—Since our last the changeable weather, and the altered and the uncertain aspect of Eastern affairs, have together seemed to have cast a damper over the spirits of all those interested in commercial matters, and the small glimmer of sun-shine which appeared last week to betoken a speedy improvement in trade has quite died away. The iron and coal trades have relapsed, and for the moment show no sign of improvement, while the stock markets, except at the beginning of the week, have all had a drooping tendency, all speculation seeming for the moment to have completely died away. As regards colliery shares few, if any, transactions have taken place. Quotations, however, remain firm about the same as last week. Chapel House shares are quoted at 3 to 3½; New Sharlston remain at 4 to 4¼; Bilson and Crump Meadow are 6⅛ to 7¼; Newport Abercarn close at 4 to 4⅛; Cakemore are 2½ to 3; Cardiff and Swansea close at 1¾ to 2¼; and Thorp's Gawber shares at 2 to 2⅛; Alltami, 5 to 5⅛; Llay Hall, 9¼ to 10; and Mold Argoed, 4 to 4½. In the Birmingham district the house coal trade has slightly improved in consequence of the cold weather. There is, however, no apparent advance in the state of the iron trade. Aldridge Colliery shares close at 26 to 27; Cannock and Huntington, 2 to 2⅛; Hamstead, 9¼ to 10; John Bagnall, 3⅛ to 3⅜; Pelsall Coal and Iron, 4 to 4¼; Spon Lane, 3⅛ to 3¼; and West Cannock, 5⅛ to 4 dis.

At the Truro Ticketing, on Thursday, 3025 tons of copper ore were sold, realising 12,384*l.* 2*s.* 6*d.* The particulars of the sale were—Average standard, 103*l.* 19*s.*; average produce, 6⅝; average price per ton, 4*l.* 2*s.*; quantity of fine copper, 199 tons 4 cwts. The following are the particulars:—

Date.	Tons.	Standard.	Produce.	Per ton.	Per unit.	Ore copper.
Feb. 22..	2294	£106 2 0	6¼	£3 19 0	12s. 6d.	£62 10 6
March 8.	1436	101 9 0	6⅝	4 5 0	12 4	61 13 6
„ 22.	3025	103 19 0	6⅝	4 2 0	12 5	62 4 0

Compared with the last sale, the standard has been stationary.

The PERKINS BEACH LEAD MINE has been reconstructed, with a capital of 30,000*l.*, in shares of 1*l.* each, to purchase for 12,500*l.* (of which 3000*l.* remains a charge on the property, and the remainder is in fully paid shares) and further develope the property, which is situated at Minsterley, Salop, adjacent to the Tankerville Mine, which has since 1870 yielded 49,800*l.* in dividends; to the Roman Gravels, which has returned 69,600*l.* in the last five years; and to the Old Smallbeach Mine, which has been at work for the last 100 years, and paid 3,000,000*l.* in dividends. The mine has already produced lead to the value of 35,000*l.* Although hitherto worked on a limited scale, it makes ready returns of very rich ore, and the workings have nearly reached that depth at which the whole of the above named successful mines in the neighbourhood began to make large profits. It is a going concern, returns are being made, and the capital of the company can be at once applied to its thorough development. The purchase includes the leasehold property, buildings, and the whole of the machinery, including three steam engines, elaborate pumping gear, crushers, drawing and dressing machines, agent's dwelling-house, stables, offices, carpenters' and smiths' shops, magazine, ore bin, &c., also a large quantity of timber, stores, mining tools, and about 600 fms. of tramways in the levels. Attention is directed to the recently extended railway to this and adjoining mines as affording excellent means of transit for ore to, or mining materials from, the Shrewsbury or other railway stations. Captain S. M. Ridge, the agent of the mine, reports that for the more energetic development of the mine the first thing to do is to put the engine and boiler in a perfect state of repair. This may be done for a few pounds, and in about a fortnight. The engine should then be kept at work day and night, to unwater the mine to the 20, or bottom level. The mine drained, there is then 20 fms. of ore ground in which lead may be seen and taken out immediately. In cutting a place for a sump-head here he has within the last few days taken out some splendid stones of solid lead. There are two good bunches of ore going down under the level to his knowledge, having followed them as far as he could after the engine was stopped. The engine should then be kept at work day and night, to unwater the mine to the 20, or bottom level. The mine drained, there is then 20 fms. of ore ground in which lead may be seen and taken out immediately. In cutting a place for a sump-head here he has within the last few days taken out some splendid stones of solid lead. There are two good bunches of ore going down under the level to his knowledge, having followed them as far as he could after the engine was stopped. This work will, in his opinion, immediately produce from 10 to 20 tons per month, and should be carried on with full power and energy. He believes the sett possesses every element of success. Capt. Arthur Waters would recommend the sinking of a new shaft on the side of the hill, not far from the mouth of the deep adit, the same to go down perpendicular until it reached the great spar lode at the depth of the said adit, when he would sink on the course or underlie of the lode. Sinking at this point could be carried on quickly and cheaply: the shaft would effect the drainage of the whole mine, and it would, in time, catch the dip of the runs of ore known to have been wrought from surface to the 20, or bottom level of the mine; and, as he has said before, would be the salvation of the property. Capt. Harris would strongly recommend the sinking of a new engine-shaft to the west, to develope and unwater the lodes in depth, taking the dip of the runs of lead ore gone down on the eastern portion of the mine as a guide; you will then be in a position to command the whole property in the most economical and advantageous manner. He considers the property a valuable one, and when developed will open out lasting and remunerative to the shareholders. Capt. Enoch Parry considers the sett a good one, and that it will turn out well if properly developed. The prospectus will be found in another column.

GORSEDD AND MERLLYN.—The new lode continues to yield well, and the company will derive great profit from the working of the same.

WHEAL NEWTON.—The first sale of silver ore produced, we are informed, within 6*d.* of 40*l.* per ton, and it is said large returns will be maintained.

WHEAL AGAR.—Capt. Harris has just inspected the above mine for a shareholder, and expresses a very high opinion of the lode, and estimates that 15 to 20 tons of tin per month can be returned as soon as the burning-house and dressing-floors are completed. No wall has yet been met with north,

WYE VALLEY.—The sinking of the old shaft for a 48 has been resumed this week, and now that the rain has ceased better progress is making with the new eastern, or Tippett's shaft, and every effort will be made to get it down to the 22 as quickly as possible. All other points are much the same.

GROGWINION.—This mine has just been visited by a few of the shareholders in the Midland Counties, who, after minute examination of the underground workings, as well as the extensive machinery at the surface, are understood to have expressed themselves as highly satisfied with their inspection. The lode is exciting much interest. Important discoveries are expected shortly.

*** With this week's Journal a SUPPLEMENTAL SHEET is given, which contains: Original Correspondence: Coal Owners, and Coal Miners—Waste of Small Coal—Patent Fuel—No. II. (A. Vassard); the New Coal and Ironstone in the District of Colville, Leicestershire (J. Harrison); Slime Dressing (A. Francis); Australian Gold Companies, and Mr. Dicker; Richmond Mining Company; the Position of Cornish Mines; the Mineralogical Society of Great Britain and Ireland (F. Bennett); Mining in Ireland; West Cork Mines, Ireland (W. Thomas); Capt. Tregay, and Pedn an-Drea Mines (W. Tregay); New Consols, and Wheal Arthur; Llanrwst Lead Mine (R. Knapp); the West Combmartin Silver-Lead Mines; Cardiganshire Mines, A.D., 1877—No. VIII. (A. Francis); Parys Mountain Mining Company (J. Roberts); Well-selected Mines as Investments (G. Budge); Bedford United Mines; the Treatment of Poor Ores (T. J. Barnard); the Brynmawr Coal and Iron Company—Foreign Mining and Metallurgy—Special Report on West Craven Moor Lead Mine, by Mr. John Lean M.E.—Llan Gan Lead Mining Company—Patent Matters—Meeting of Economic Life Assurance Society, Old Treburgett, Trebeigh Consols, St. Patrick, Van, Pandora, Penstruthal Consols, East Pool, Cotton Powder, Bilson and Crump, and other Companies, &c.

Notices to Correspondents.

FERRIE'S FURNACES—At the Moukland Iron and Coal Company meeting, the Chairman said that a good deal had been said about the expense of reconstructing the furnaces, and converting them into patent furnaces, and a good deal of doubt had been expressed on many occasions as to whether the money had been well employed. Mr. Ferrie's estimate of the result of the conversion of six out of the nine furnaces was that the saving of coal on the make of pig-iron for 1876 had been 46,800 tons, which, at 6s. a ton, amounted to 15,430*l.*, and the saving of dross amounted to 9750*l.* The total amount due to the saving of fuel by the conversion of these furnaces was 24,180*l.*; over and above that in the malleable department, the fact that they now used no dross had enabled Mr. Ferrie, by an alteration in the puddling furnaces, to puddle with dross instead of with coal, which represented upon the make something like over 1500*l.* a year.

Received,—"J. P." (Limerick)—"E. M."—"W. T.": We have had similar enquiries.—"Shareholder" (Shrewsbury): Write again.—"Amicus" had better write to the secretary of the company.—"Intending speculator" (Richmond): We never give such advice: apply to a broker.—"R. W. B." can find all the particulars in the Journal at the time: we could not copy them out.—"Novice": We publish a Glossary of Mining and Smelting Terms, which will be forwarded on remitting 2s. 2d. in stamps.—"N. T."—"Shareholder" (Dundee): See a report of the meeting in this week's Journal.—"Shareholder" (New Consols)—"Shareholder" (Perkins Beach): Next week.—"Not Satisfied": We could not insert such a statement; it would create an amount of personal correspondence that we should not care to publish.—"E. W. B.": We shall be glad to report the particulars.

THE MINING JOURNAL,

Railway and Commercial Gazette.

LONDON, MARCH 24, 1877.

THE COLLIERY EXPLOSION NEAR SWANSEA, AND ITS LESSONS.

After two days patient and careful enquiry the inquest upon the bodies of the 18 poor fellows who lost their lives by an explosion of fire-damp in the Weig Fach pit, Forest Fach, some three miles from Swansea, on the morning of the 8th ult., was brought to a conclusion on Friday evening. Lamentable as was the loss of life on that occasion, it is some small consolation to know that the cause of the explosion has for once been clearly ascertained. Explosions, generally speaking, are involved in so much mystery as to be unable with certainty to trace their origin, and consequently those salutary lessons cannot be inculcated which such visitations should teach. Such, however, is not the case with respect to the explosion in the Weig Fach pit, for not only has the locale of the explosion been discovered (although no great damage was done the workings of the colliery), but the cause of the unfortunate event has also been demonstrated beyond the shadow of doubt; and that cause, we regret to say, is another instance of that criminal and reckless breach of rules and disregard of life on the part of the collier which is unfortunately of far too common occurrence, and which no amount of ventilation or supervision on the part of the manager can altogether prevent.

Without wearying the reader with any long detail of the evidence which was adduced at the pains-taking inquest held before Mr. E. STRICK, the district coroner, in the presence of Mr. W. E. WALES, the Government Inspector, we may briefly state that the Weig Fach pit belongs to the Landore Siemens Steel Company, under the general management of Mr. T. GLASBROOK, a gentleman who has had considerable practical experience in colliery operations, and is admitted to be an able and careful manager. It is comparatively a new pit, and is ventilated by means of a fan, and this system was so efficient that for some time safety-lamps were not considered necessary. As, however, the workings were extended, and became more intricate, safety-lamps were exclusively used, and the ordinary rules with respect thereto enforced, with, however one important point. The rules of the Weig Fach Colliery prohibited the use of any naked light, matches, or any apparatus for striking a light, beyond the lamp station—opposite No. 18 level—"without the express authority of the fireman or other superior officer." Now, as the Government Inspector very properly pointed out that the Mines Regulation Act expressly provides that no naked light of any description shall be taken beyond the lamp station, and as the Act of Parliament over-rides all and every special rule, it is obvious that no one—not even the general manager himself—has the right to give authority to take a naked light beyond the lamp station, and this clause in the special rules of the Weig Fach Colliery must be at once struck out. It is incumbent upon everyone connected with a colliery, from the very highest in command to the very lowest, to rigidly adhere to and enforce every provision of the Act of Parliament, however inconvenient, or even vexatious, such obedience should appear. We perceive from the evidence that such a breach of rules as permitting a naked light beyond the lamp station did take place upon one or two occasions, such breach not only being sanctioned but authorised by ABRAHAM BEVAN, the overman, one of the killed, but was properly stopped by the fireman, REES, who had more regard for his own personal safety and that of his fellow-workmen than characterised BEVAN in most of his conduct in the colliery. The known use of a naked light, however, beyond the lamp station was some days prior to the explosion, and did not cause the unfortunate catastrophe.

The workings extending and becoming of a more intricate character the ventilation became somewhat impaired, but not to an appreciable extent, as the fireman REES and one or two others swore most positively and distinctly that they had not seen gas in the face of No. 20 west top hole, but a little gas had been found in No. 19 level. Having regard to the evidence of the Government Inspector, Mr. WALES, however, and also to the positive evidence of one or two working colliers upon that point, we cannot place very much credence upon the statement of REES; and to our mind the fact that a small hand-fan was used to force the air into the top hole is conclusive that gas was occasionally seen there. We have no hesitation in saying that this small fan should never have been permitted in the pit, but more efficient steps taken to drive the air into the top hole. Accumulations of gas, we may take it, did occur in the top hole No. 20 west, whatever may be said to the contrary, but it was of such small quantity that it could be easily driven out in about half an hour by means of the fan. It was not in itself dangerous, but proved the necessity for special precaution on the part of the overman, ABRAHAM BEVAN, who recklessly disobeyed the caution which such premonitory symptoms ought to have taught him, paid the death penalty of such recklessness, and unfortunately at the same time sacrificing the lives of his 17 other workmen who were by no means responsible for the reprehensible conduct of which we shall presently show this man to have been guilty.

A local fair being held in the neighbourhood the men did not work the usual turns on the Wednesday before the fatal Thursday morning, and this circumstance was contributory to the explosion. The small fan being thus idle for some 18 or 20 hours, larger accumulations of gas than usual would have taken place on the morning of the explosion in the face of the top-hole of No. 20 west level. And here we see the cause of this lamentable explosion, which indeed we could scarcely credit it, were not that the evidence is of such a conclusive character as to set all doubt at rest. The open lamp of the overman, ABRAHAM BEVAN, was found within 10 yards of his lifeless body in No. 19 level. The gas in No. 20 top-hole being dislodged by the small hand-fan would pass No. 19 level, and here it came in contact with the open lamp of the overman, and the fatal result ensued, the 18 dead bodies being found within a few yards of this spot. How this man opened his lamp is not known, but that he coolly and deliberately removed the top no possible doubt can exist, and that this wicked act was the direct cause of his own death and of 17 other poor fellows is equally self evident. No words are sufficiently strong to condemn such conduct. If men in authority defy all rules, are utterly reckless of their own life, and that of their fellows, if they will ignore every premonitory sign of danger, and laugh with impunity at all regulations, what can be expected on the part of the less responsible, but more ignorant working collier. This colliery was worked with due care and caution so far as the general management was concerned, was regularly inspected daily, and the small accumulations of gas not necessarily dangerous, provided ordinary care had been exercised on the part of those to whom such care was entrusted. BEVAN proved himself far more reckless than incapable, more negligent than ignorant. He knew the rules and knew the danger of gas, he wilfully and recklessly disobeyed both, and sacrificed life in a manner inconceivable. There are persons who say that colliery explosions can be altogether avoided. We should very much like to know how, when officers of BEVAN'S recklessness so flagrantly ignore rules and defy known danger.

STEEL-HEADED RAILS.

There are some diversities of opinion as to the merits of steel rails and steel-headed rails, but the latter have at any rate found a stout, and, indeed, a redoubtable, champion in Herr ADOLPH GRAU, who has manufactured them since the autumn of 1868 at the Maximilian Works at Haidhof. During 1874 some blast-furnaces erected at Kamsdorf, Thuringia, in connection with the Maximilian Works were blown in, and the supply of crude iron has since been obtained from these furnaces. Before 1874 the iron used for the purpose was either the best English hematite pig or that of the Osnabruck, Niederschelden, and Styrian districts, the process of conversion being partially regulated by the spectroscope. The rail pile after heating is hammered, re-heated, rolled into the finished rail, and sawn to the desired length. From 12 to 20 of the rail ends thus cut off are every day tested by doubling under a steam hammer, this being seldom effected without signs of fracture. Other rails, again, are subjected to the test of a weight of 11 cwts. falling freely through a distance of nearly 10 ft., the points of support of the rail under trial being about 3¼ ft. apart. The limit of depression has been fixed at a trifle under 6 in., and in all cases this has been satisfactorily borne. Bars were placed on each side of the steel-head plate with the view of preventing the burning of the former; this arrangement was, however, discontinued in 1871, it being found that in the process of rolling these protection plates were generally extended too far up the sides of the rail-head, and when subjected to the wear and tear of traffic separated from, and were stripped off the steel portion. Rails which were rolled from this form of pile in 1869 and 1870 failed to the extent of 1 to 2 per cent. of the whole production. In 1871, however, there were only a few instances of failure, and since that year the rails have been totally exempt from it. Even where failure occurred the separation of the steel from the iron proceeded so gradually as to render the withdrawal of the rails unnecessary until six months after the first signs of weakness had appeared. Rails manufactured in 1871 were, however, subject to another form of failure, which first presented itself in the shape of dark-coloured streaks, extending from the rail end along the head, developing into cracks of from 3 to 6½ ft. in length, followed by partial breaking up of the surface. This was attributed to the unsuitable quality of the steel, and might possibly have been avoided by more careful conversion and testing. There were, however, few absolute ruptures; only nine were reported, and in each case they took place at the fish-bolt holes, which were of rather large dimensions. The form of the steel-head plate was modified in 1871, it being rolled with a projection on the under surface to ensure a better combination with the iron portion of the rail; this form has since been adhered to.

We may now advantageously give a few details as to the practical results which have attended the adoption of the steel-headed rails, of which Herr GRAU is an advocate, upon sundry Bavarian railways upon which they have been laid down. Between 1869 and 1873 inclusive 14,716 tons of steel-headed rails were laid upon the Bavarian State lines, and of these rails 124 tons failed in 1869, 61 tons in 1870, 141 tons in 1871, 1 ton in 1872, and *nil* in 1873, or 327 tons in all. The percentage of failures to the whole quantity of rails laid down during the five years was thus 2·23 per cent. If we exclude 1869 from the analysis, and deal only with 1870, 1871, and 1873, there will remain 13,324 tons delivered, while the proportion of failures will be found to be only 203, or 1·50 per cent. of the whole deliveries. Some similar steel-headed rails were also laid in 1869 upon the East Bavarian Railway at places where the gradients are 1 in 100, and the curves of 14½ chains to 26 chains radius. In 1869 the percentage of renewals was 0·60; in 1870, *nil*; in 1871, 2·65; and in 1872, *nil*. Among the causes of failure there were only three cases of rupture—two through the fish-boft holes, and one at a distance of 3 ft. from the rail end, the remaining defects comprising longitudinal splitting, &c. The steel-headed rails made for the Bavarian State railways weighed, it should be added, 75¾ lbs. per yard, and they were rolled in lengths of 19¾ ft. and 20¼ ft. Where failures occurred they took place generally upon those parts of the system where blocks were in use; where sleepers were laid the rail renewals which had to be made were inconsiderable. Upon a section of single line between Cologne and Vienna, where there is a daily traffic of 144 engines and trains, steel-headed rails were laid in 1871, 1872, and 1873 at the most trying places—upon gradients of 1 in 100. In all 3980 steel-headed rails were thus laid down during the three years, and no renewals had to be made.

THE FORMATION OF COMPANIES.—Mr. Chadwick's Bill to amend the Companies Acts, 1862 and 1867, provides that every prospectus or notice announcing for subscription, or containing an invitation to subscribe, for any share, bond, debenture, or other capital of any company, shall state the names, addresses, and occupations of the vendors of any business or property intended to be sold or to be acquired by such company. It shall state the date of and the names of the parties to and the material contents of every contract, other than contracts for supplies or services not exceeding 200*l.* in value, made before the issue of such prospectus or notice, by or on behalf of such company, or by any person who is or afterwards becomes a promotor, director, or trustee thereof, where such contract is to be carried into effect out of the funds or capital of the company to be subscribed under such prospectus or notice, or is for the benefit of such promotor, director, or trustee, in relation to the promotion or undertaking of the company. It shall contain a copy of the Memorandum of Association of the company, and of the names, addresses, and occupations of the persons who have signed the same, and the number of shares in the company agreed to be taken by each of such persons. Every prospectus or notice which does not comply with the aforesaid requirements, shall be deemed to be fraudulent on the part of every promotor, director trustee, or officer of such company who has knowingly issued or been concerned in the issue of such prospectus or notice as regards any person applying or subscribing for any share, bond, debenture, or other capital in the company on the faith of such prospectus or notice unless such person has had notice of the omitted particulars. Every person who has signed the Memorandum of Association, or is at the date of the issue of any such prospectus or notice entitled under any agreement, either absolutely or contingently on the formation of the company, to be a director of the company, or be allotted any share, bond, debenture, or other capital therein, or to receive any payment out of the funds or capital of the company, shall be deemed to be a promoter of the company within the meaning of this section.

ENGLISH AND GERMAN WORKMEN.—Herr Alfred Krupp has again addressed a circular to the employees in his steelworks, pits, foundries, &c., with reference to the existing economical depression, and the Social Democratic agitations. Herr Krupp, who is the most important employer of labour in Europe, remarks that the depression has already seriously affected very many mills, foundries, and pits in Germany. Lower prices have been followed by lower wages, and some establishments have been entirely closed. Herr Krupp warns his own workpeople that an improvement cannot be brought about by either a change of the constitution, the Government, or the laws. Industry, order, and frugality, are the best safeguards against want, and if these failed the best of governments would be unavailing. The existing depression is due mainly to the too extensive undertakings of the past few years. The inflation brought only higher wages to the workmen, while it ruined many employers. The workpeople ought to be able to face the present hard times with the surplus earnings of the past; but if they have spent these they have at least enjoyed them, and must now make up by thriftiness and diligence. In 1870 many workmen left their places, and many colliers turned out of the pits, notwithstanding the high wages they were receiving, in order to force the employers to further and impossible advances. Such conduct could only be pernicious to the interests of those concerned, and it led to a diversion of trade into fresh channels. "For instance (continues Herr Krupp) I remember that miners in my own neighbourhood were closed in order to compel me to shut up my factory, and that it was only with considerable extra outlay that I succeeded in warding off this calamity from my workpeople by bringing coal from Saarbruck." In conclusion, Herr Krupp holds up the case of England as a warning to Germen workmen. "England," he says, "became great and powerful through her industry, but then her workmen established unions and struck work in order to force wages up. As a result, a large share of England's work has gone abroad. German industry has greatly benefited by the blunder of the English workmen. Should German workmen follow this bad example, our industry will in its turn be driven abroad."

COAL AND IRON IN THE UNITED STATES.—The aggregate production of anthracite coal in Pennsylvania to Feb. 24 this year was 2,561,864 tons, against 2,075,710 tons in the corresponding period of 1876, showing an increase of 486,154 tons this year. The aggregate production of bituminous coal in Pennsylvania to Feb. 24 this year was 404,114 tons, against 390,276 tons in the corresponding period of 1876, showing an increase of 13,838 tons this year. The pig-iron market has been rather more settled at Philadelphia, but the demand has still ruled comparatively inactive; consumption is, however, increasing upon the whole. The business doing in bar-iron has been increasing of late at Philadelphia, and some of the mills are now running to their utmost productive capacity. The sale in small lots of some 6000 tons to 8000 tons of steel rails has been noted at Philadelphia, but buyers are in the market for larger quantities. Southern railroad companies are expected to purchase rather largely in the course of the next few weeks; there is also a demand from sundry railroads in the Eastern States. There has been little doing in iron rails of Philadelphia; only companies with a second rate credit appears to be enquiring for them. At Pittsburgh the steel trade is becoming active; the southern trade has considerably increased. The Phœnix Iron Company has closed a contract with the Cincinnati Southern Railway Company for 2000 tons of iron for a bridge over the Tennessee river.

REPORT FROM CORNWALL.

March 22.—The event of the week is clearly the untoward events that have occurred in connection with New Consols—untoward, indeed, yet not so much so as they might have been, nor is hope by any means wholly lost. The mere fact that a petition is presented in the Stannaries Court to wind-up a concern by itself means very little. Nothing is easier than to take such a step if it is desired to injure a property. Nothing more injudicious than to assume that such a step necessarily involves—or, indeed, even implies—failure; and so to proceed to write the epitaph of a "bal" before it is fairly dead. What has happened within the last few days with regard to New Consols is a striking illustration of these remarks. A petition was presented in order that the concern might be wound-up, and the epitaph was written; but somehow the patient is not dead, though it may fairly be said to have had a narrow escape. The truth is that the experiment at New Consols has not only been novel but costly; and, while it has been prosecuted to the verge of success, financial difficulties have been encountered which at length, after a hard struggle, made it needful for the shareholders and creditors to confer together as to the best steps to be taken for carrying on the mine.

Accordingly, on Monday last, a meeting was held at the Duke of Cornwall Hotel, Plymouth, under the presidency of Sir James Anderson, which lasted for nearly five hours. It was private in the sense that no representatives of the Press were present, but its general tenor was as follows:—Sir James Anderson explained that there were 40,000*l.* owing to debenture-holders, 4000*l.* for labour cost, and 17,000 for merchants' bills. The company had been spending rather too much lately, but if the creditors would take bills for 12 months they would work the mine, and at the end of that time pay in full. If they did not accept the offer a petition would be filed for winding up the concern voluntarily, when, as the debenture-holders would come first for payment, it was improbable that the creditors would get anything. It was, on the other hand, pointed out that if the creditors accepted bills for twelve months, during the time they were running they could not in any way interfere, even if the directors sold off all the concern. Seeing this, by a majority in debts of 6000*l.*, the creditors refused to agree to the terms proposed, and resolved to petition independently for a compulsory winding-up of the concern. Subsequently a unanimous proposition was come to, to the effect that if any of the directors would guarantee 5s. in 1*l.* in the first six months the creditors would wait the other six months for the remaining 15s. in 1*l.* from the company; but the proposition fell through, because Sir James Anderson intimated that no such guarantee could be given. The creditors then resolved, having every confidence in the manager—Capt. R. Pryor, of Redruth—and the value of the concern, to work the mine themselves to pay the 5s. in 1*l.*, and the directors thereon agreed to give the creditors bills for 12 months, but in the meantime to pay them 5s. in 1*l.* from the products of the mine, and at the end of the period the other 15s.

And thus it comes about that New Consols has another chance. It would have been a thousand pities if an experiment so important and so pluckily conducted should have come to such an untimely end. Of course, there are plenty of people wed led to old ideas who are quite ready to say—and, indeed, are now saying—"I told you so." But mining must move with the times. Whatever may be said, New Consols has proved that low produce ores may be profitably treated by the wet way. Its difficulties are really not of the present, but of the past, and we are glad indeed to find that those who have borne the burden and heat of the day have still their prospect of the reward which sooner or later this modern method of treating ores must yield.

East Pool, despite the heavy influx of water with which the adventurers have had to contend, has managed to give a dividend—thanks not merely to the excellent way in which it is worked, but to the rigid economy exercised.

It is, we presume, a fact not generally known that Wheal Mary Ann is still in the land of the living so far as litigation is concerned. A dispute has recently come to arbitration in which the surface owners of the land from which the mine was worked have claimed nearly 1000*l.* for surface damage. The facts, so far as they have transpired, show with what untoward conditions mining has to contend in many instances, and the utter want of liberality frequently displayed by lords who are enriched without risk. Wheal Mary Ann sett was first granted in consideration of a premium of 2000*l.*, payment of rent for surface occupied, and tenants' compensation, and the utterly outrageous proportion of 1-12th dues. When the sett was near its expiration a further demand of 100*l.* an acre for the land damaged was made as a condition of granting a new sett. This the adventurers refused to pay, but subsequently they did pay about 266*l.* as their proportion of a claim of 800*l.*, leaving the other two-thirds to be paid, fairly enough, by a couple of mineral owners whose lodes had been worked by the Wheal Mary Ann Company through their shaft, but whose surface lands had not been damaged. Now Mary Ann has been abandoned the demand is made by the representatives of the grantee of the sett for 100*l.* per acre, less the 266*l.* paid. What the arbitrators may have to say to this we cannot say, but so far as the principle is concerned we may remark that mining would very soon be dead if this sort of grasping spirit were displayed by lords generally. We must come at last to fair compensation for surface occupied or damaged, and dues on profits—not twelfths, or even fifteenths, to which these were afterwards reduced, on gross returns.

Capt. Provis, a well known and much respected agent of Dolcoath, has met with a serious accident. On Friday evening as he was walk-

ng about the mine he unfortunately got entangled with a rope, and was pulled into a flat pulley, and had his left leg very badly fractured. Assistance was soon at hand, and Capt. Provis was taken home, and promptly attended to by Dr. Hutchinson.

There is again another chance for the Perran Iron Mines, which some day or other will certainly turn out trumps. Mr. Roebuck, who has been indefatigable in his efforts for the development of Cornish industry, and to whom the Cornwall Minerals Railway is due, has succeeded in interesting a number of influential and wealthy gentlemen in these mines, and they have been again visited with a view to their re-working on the largest scale.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

March 22.—I am unable to report an improvement in the demand for finished iron. Certain leading firms are now compelled to limit their operations. The Earl of Dudley has notified to some of his puddlers that they will have to leave. The Tividale tin-plate works of Messrs. Budd stopped on Saturday, and next Saturday the Wolverhampton works of Messrs. E. P. and W. Baldwin will stop—both until the demand has revived. Prices are easy in the majority of transactions, but 9*l.* is still required for marked bars by the leading houses. The pig trade is unusually quiet for this time of the year. Very little can be sold, and the consumers of pigs made in other districts, and sometime ago bought, are more than heretofore desirous that there should be slow deliveries. The tendency of the pig market is decidedly downwards, though with best Staffordshire finished iron makers' rates are firmly upheld. Coal is without change in price; it is not easy to get remunerative terms, and there are hopes that the men may see their way to come to some arrangement with their employers which shall stimulate business before the expiration of the notice for new terms at Michaelmas. At present, however, there is very little ground for the expectation. The Unionist leaders have met upon the question of the notice, and have determined to hold a general meeting of district representatives. Meanwhile Warwickshire colliery owners who are not within the compact are giving notice, some of them for a drop of 7½ per cent., or longer hours. From letters which have been received by the Unions' agent in the Warwickshire field it is manifest that if the Unionist leaders can have their way the men will not consent to work more than their present hours, notwithstanding that they are only eight to the day.

There have been sales of Sandwell Park Colliery shares since my last at 20*l.* 10s. and 20*l.* 15s. respectively for the 10*l.* shares, and Messrs. John Bagnall and Sons 10*l.* shares have changed hands at 3*l.* 10s. There are buyers of the Pelsall Coal and Iron Company's shares of 20*l.* (15*l.* paid) at 11*l.* dis. Cannock and Huntington and Hamstead Colliery shares are each still offered at 2*l.* discount; Spon Lane, 8*l.* 10s. paid, at 4*l.* 1s. 3d. discount; West Cannock Colliery, 8*l.* paid, at 5*l.* discount, and 20*l.* paid at 2*l.* 10s. discount.

At the Walsall Wood Colliery, during the past few days, a seam of fine quality, nearly 8 ft. in thickness, has been struck at a depth of 388 yards. The company, it is stated, will sink their pits 160 yards further, to the most important or deep seam before working. The company's license to store 4000 lbs. of gunpowder has been renewed.

The Cannock Lodge Colliery, too, have just found coal. At the sinking at Bloxwich the shallow seam coal, 6 ft. 3 in. thick, has been struck at a depth of 136 yards, and the deep coal was subsequently cut 147 yards down.

Mr. George Eglington, of the Deepfields Furnaces, carrying on business under the style of the Deepfields Iron Company, has filed a petition in the Dudley County Court for the liquidation of his affairs by arrangement. The liabilities are estimated at 15,000*l.* Mr. C. A. Harrison (Laundy and Co., accountants, Birmingham) has been appointed receiver and manager of the business until the first meeting of creditors, which will be held in Birmingham on April 5.

There is a strike of the Clee Hill stone miners in Shropshire against a drop of 10 per cent. upon piecework and an additional hour in day work, and 400 men are out. The stone in this case is mostly granite.

A little more is doing in the plate trade in North Staffordshire, but it is little; upon the whole, fewer orders have been received this than were received last week. The bulk of the business doing is in bars. Pig-iron sells tamely, and prices are slightly easier. The coal trade is not in a brisk condition, slack is hard to dispose of, but there is a better enquiry for house coal, for which at the pit mouth 12s. 6d. is the current rate.

The fourteenth ordinary general meeting of Muntz's Metal Company was held at the Great Western Hotel, on Wednesday, Mr. Jaffray, the Chairman, presiding. The directors' report stated that last year's profits were 21,402*l.* 13s. 10d., which, with the amount brought forward from last year's account, made a disposable balance of 29,099*l.* 4s. 3d. An interim dividend disposed of 6703*l.* 16s. 5d., and the directors proposed to divide a further sum of 11,173*l.* 18s. 7d., making the dividend for the whole year 10 per cent., to write off 1000*l.* from machinery and tools, and 868*l.* 13s. 3d. from land and buildings, leaving a balance of 9352*l.* 16s. to be carried forward. The report was adopted and the dividend recommended declared.

TRADE OF THE TYNE AND WEAR.

March 21.—The Coal and Coke Trades are unchanged, with the exception that house coal has been weaker. There is no improvement in steam coal, and most of the works are doing little. The Dudley Colliery has been closed for the present, and all the erections on the surface taken down. They will be rebuilt in modern style, and the screens adapted for the new system of weighing the coals. The feeling in commercial classes is not at all improved; indeed, the depression appears to get worse week by week, and the dread of war in the East will not be removed until the demobilisation of the Russian and Turkish armies commences. The miners at Plashetts are still idle, as they have refused to accept the decision of the joint committee upon a local reduction. This reduction is equal to 4d. per day, and was agreed to by the joint committee some time ago. This is an act of insubordination not often met with amongst the miners in this district.

Fair progress continues to be made with the new system of weighing the coals sent out by the men in Northumberland. The tonnage price paid has been increased in proportion to the amount of small produced in the old system, and this increased rate varies from 35 to 55 per cent. on the old rates. This, of course, is an advantage to the men if they can reduce the quantity of small coal produced; the result is that the men generally are earning higher wages on the new system than they did previously. The average wages have increased 4d. per day, and the men have reason to be quite satisfied with the change. The masters will also reap a benefit in proportion, as any reduction in the quantity of small produced increases the quantity of round coal, which is worth at least 8s. per ton more than the small coal. The chemical market has been dull, and prices have again fallen a little, in spite of the fact that only small stocks are held; there is, however, still a feeling that matters must improve soon. The Iron Rail Trade may be considered as almost extinct, steel rails having nearly driven iron rails out of the market altogether, and this must be the result if it is correct, as alleged, that steel rails are in all respects superior to iron rails, as the price of steel rails is now little more than the cost of iron.

The Tyne Commissioners Bill, now before a Committee of the House of Commons, attracts much attention. The formation of the Coble Dean Dock, and the completion of the scheme for improving the river up to Blaydon, will, there is little doubt, increase the trade of the Tyne both in imports and exports. The evidence given before the Committee opens out questions of the greatest importance in connection with the staple products of the great coal district. The evidence of Mr. G. Forster, Sir Wm. Armstrong, and others is especially interesting, and other important evidence may be expected from Sir G. Elliot and others this week. The total shipments of coal from the Tyne is constantly increasing, and in 1876 the shipments were—Coastwise, 2,705,794 tons; foreign, 4,432,845 tons: total, 7,138,639 tons.

It is not generally known that coal has been worked to some extent under the sea in Northumberland at the Cambois Colliery. Coal has now been worked upwards of three miles under the sea. As this coal belongs to the Crown they have a very valuable property there which must increase every year, as the quantity on the coast—that is, Northumberland, taking the area at 100 square miles—five miles out at sea—is estimated at 403,000,000. This coal at 6d. per ton, a moderate estimate, amounts to nearly 11,000,000*l.*, and it may safely be assumed that the coal under the Durham coast will greatly exceed this quantity, so that altogether it is probable that the coal under the North Sea belonging to the Crown is worth at least 30 millions sterling. As the coal has been worked under the sea a considerable distance at Ryhope and at Cambois, it is evident that this coal is available, and that it will prolong the life of the coal field to an extent which cannot be defined with our present amount of information. We also learn further from the evidence of Mr. G. B. Forster and Mr. Simpson, the greatest living authorities on the question, that in 1875 the output of coal in Northumberland, including the lime fields, was 6,000,000 tons. Mr. Forster estimates that the Low Main Seam, the best steam coal in the county, will last 100 years, and the whole coal in the county 335 years. He does not agree with the opinions given last year by Sir George Elliot. This estimate takes the annual output at 7,000 000 tons, giving a total of 2,346,000,000 tons. The land coal will last about 270 years.

At the Bristol Mining School Capt. Brain recently delivered a lecture on the application of electricity to mining operations. He declared that Prof. Siemens had so perfected the electric light that our collieries might be safely and effectively lighted by its means, better, indeed, than by any other method. At the present moment Capt. Brain is making some large electric batteries to drive a magnetic machine for pumping water out of the workings at a distance from the shaft. Economy being a prime consideration, a quantity of old material has been used up in the construction of these batteries—iron tubs, &c., and hematite ore. Already an electric engine is employed by the lecturer in the Trafalgar Mine for a similar purpose. The lecturer also strongly advocated the use of electricity for blasting, the great advantage of using it in the place of gunpowder, &c., being greater safety and protection of life, economy of explosives, capital and time, and the application of a force superior to all other known forces. In this district and in Cumberland attempts have been made to work steam-engines at a distance from the shaft, but the means employed to consume or prevent smoke and heat have been abortive. The only engine at present used in this position, that is at a distance from the shaft in workings, are worked by means of compressed air conveyed to the spot by iron pipes.

REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

March 22.—There is again no improvement to note in the staple trades of this district. So far as the finished iron department is concerned, prices continue exceedingly low, and of rails there has only been one clearance made during the week, and that was of about 400 tons only for Bilboa. There are still, however, orders in hand for India, Brazil, and the Cape, and now that the Baltic is opening up it is probable a fair amount of business will be done with Sweden and Denmark. So far as pig-iron is concerned there is no change to note, and the foreign demand for bars is almost nil. Large shipments of Spanish ore are made every week to Newport. Preparations are being made to start two blast-furnaces at Abersychan. No fresh orders of importance have recently been lodged in the district. The new steel works at Rhymney are being pushed forward as rapidly as possible. The general aspect of the trade is unaltered. Of the tin-plate industry very little of a favourable nature can be said. True it is that prices are firmer, but notwithstanding the low rates which obtain, and the restriction in make, stocks are in many instances accumulating. The Pontymister Works, near Newport, have just been closed for this reason.

Next to refer to the Coal Trade—nothing of a favourable nature can be pointed to this week. The demand for steam qualities has to some extent declined, and the shipments of foreign have fallen off. The largest customers are the Mediterranean and French ports. For house coals there is only a moderate demand, and for patent fuel a rather improved enquiry exists. The output of coal is undoubtedly large, but could without much trouble be doubled. Far from increasing the output, however, the news of a colliery being closed, or a portion of the employees being discharged, is continually coming to hand. The Blaendare Colliery, Pontypool, has been closed, some dispute as to wages having occurred. The Tir Phil Colliery, New Tredegar, will also shortly be closed. In the Merthyr district the men are only working about half time. The 4-ft. seam has been won at Havod Rhondda; the coal is of good quality. The Great Western Railway Company have lately lowered their coal rates from the Aberdare Valley to Newport, and the Alexandra Dock Company have it in contemplation to provide additional facilities for the shipment of the rapidly increasing quantities of coal which arrive. It is said that a serious dispute exists between Messrs. Coffin and Co. and the Glamorgan Colliery Company, both of whom have property in the Rhondda Valley. The dispute is with reference to the working of coal, it being alleged that the Glamorgan Company have improperly worked a seam not their property. Between 15,000*l.* and 20,000*l.* are said to be involved in the dispute.

The inquest on the bodies of the 18 men who were killed at the colliery explosion at Forest Fach, near Swansea, has terminated. The result is a melancholy one; showing, as it does, that there was negligence on the part of two or three men who were placed in responsible positions. The verdict was as follows:—"That the explosion was caused by the negligence of David Davies, the fireman, for not clearing the gas on the morning of Thursday, the 8th inst., before the men went to work, and the carelessness of Abraham Bevan, the overman, in using a naked light. The jury strongly recommended that the use of small fans should be abandoned, and consider that if the rules of collieries were strictly adhered to accidents of this kind would be prevented. They also thought that Thomas Rees, a fireman, had been very careless, and should be cautioned." About 100 men have now resumed work at the Mardy pit, Rhymney.

The case of the Tin-Plate Decorating Company, who carry on business at Neath, *v.* Messrs. Lloyd and Sons, of London, has been concluded, and Vice-Chancellor Bacon's decision given. The suit was for an injunction to restrain the defendants from infringing a patent for improvement in the process of producing ornamental impressions upon tin-plates, such as are used for canisters and boxes. The injunction was granted, with the costs of the suit. The case was one of great interest to the trade.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

March 22.—There has been little new to report of interest with respect to Derbyshire mining and manufacturing. At the lead mines there is nothing that can be called activity, seeing that the produce of them appears to be on the decline more than otherwise, whilst capitalists do not favour the lead districts of the county. The number of mines that have been opened out from time to time is large, but a good many of them have been abandoned either from want of capital or not having turned out equal to expectations. At the collieries there has been a moderate amount of business done, but not sufficient to keep them fully employed. To London a fair tonnage of house coal has been forwarded, but the large quantities of seaborne coal that are now being sent there causes the competition to be keen, and the profits very small. This state of things is certainly not likely to improve, and there is every appearance that we shall have a particularly dull summer trade with the metropolis. There has been no increase made in the demand for steam coal, but the season is now fast approaching when a marked change for the better may be looked for, but whether the business will be equal to that of former seasons is somewhat doubtful. In iron there has been no change, either as regards pig or the manufactured article. The extensive works now being erected by the Midland Railway Company at Derby are making headway, and will be about the finest in the country. The company propose turning out almost everything that will be required, including Bessemer and other rails. The strike of the boys at the Renishaw pits, which in consequence were kept standing for several days, has been brought to a close. Efforts are being made at several places to get the miners to again become connected with the Miners' Association, but a good many show an indisposition to do so, seeing that they suffered a loss and could get no pecuniary assistance at the very time they most required it.

A little more activity is descernable in some branches of the Sheffield Trade, but in others matters are very quiet. Makers of Bessemer rails, tires, and axles have been doing tolerably well, some being much busier than others, but contracts, it is said, have to be taken at a low figure. The heavy armour-plate mills are not turning out so much work as they did during the early part of the year; but, as this branch belongs solely to Sheffield, the probability is that it will improve. A fair amount of business is being done in ship and boiler plates, and in ordinary railway material. The foundries, as a rule, are doing very well, some large orders having been recently given out for water and gas pipes, stoves and grates. For the better descriptions of cutlery there is rather more doing by several of the leading makers, whilst orders from Australia and other of our colonies for edge tools and light implements have come more freely to hand. The collieries in the neighbourhood of the town are working as usual, but they are not so fully employed as could be desired. In other parts of South Yorkshire a steady business is being done at the works. Between Sheffield and Masborough the Bessemer works are going along very well, whilst the foundries have nothing to complain of. Colliery owners still complain of the disadvantageous position they are placed in with respect to the London trade, owing to the railway rate being so very much higher than that paid by those persons sending by sea. The consequence has been that since the year set in there has been a considerable falling off in the quantity of Silkstone and other qualities sent to the metropolis as compared with the same months last year.

The men at Darfield Main are still out, as they refuse to accept the terms offered, which they say would be considerably lower than that proposed to and accepted by the other colliers in the entire district.

The Permanent Miners' Fund for the West Riding may now be said to be established, its head quarters being fixed at Barnsley. This in all probability will cause hundreds of men to refrain from joining, or continuing in the association, whilst it will also have the effect of making it unnecessary to appeal to the public for subscriptions on the occasion of a colliery catastrophy.

REPORT FROM THE NORTH OF ENGLAND.

March 22.—There has hardly been any change in the coal trade during the past ten days, so far as prices are concerned, but coal-owners are hopeful that the steps they have recently taken to secure a lengthening of the hours of labour and a reduction of miners' wages will result in bringing down the cost of production to such an extent as to furnish a little more chance of profit than is now available. The new sliding scale will come into operation on Saturday week. In the meanwhile steps have been taken, by an examination of all the fitting books throughout the county, to ascertain the net average realised selling price of coal. That examination is necessarily a work of considerable time and trouble. It will take the accountants employed upon it quite as much as they can do to have it completed against the required time. The months for which the figures are being taken out are those of November, December, January, and February, and every sale of coal made in these four months by the collieries in the association will be embraced in the average sought to be reached. When I add that the production of the county of Durham is now some 25,000,000 tons per annum, it will be seen that the figures now being taken out will broadly apply to over 6,000,000 tons of coal—a fact which at once establishes the importance and the laborious character of the investigation.

It is, of course, impossible to foreshadow with even approximate accuracy the result of the inquiry as to the present realised selling price of coal. It is, however, beyond all dispute that the average will now be lower than that of August last year, when it was only 5s. 8d. per ton, or, in round figures (dropping only decimals), a sixpence per ton above the average realised price of 1871. Some coal-owners with whom I have conversed anticipate that the average will now be even less than that of 1871, and, if so, a reduction of wages must, according to the provisions of the sliding scale, come into effect. I have been informed on good authority that at some of the best household coal collieries in the county the average price realised at the present time is not more than 4s. 6d. per ton—adding together round coal, nuts, and small—and it is notorious that household coals are even more remunerative than some other qualities, and notably manufacturing sorts. I am greatly afraid that the prices found for the last four months will be lower than even the coalowners themselves anticipate. During that time there has been a good deal of underselling, efforts of an almost frantic character having been made in some quarters to induce trade and keep the pits going. The demand for coke is fairly well maintained, but there are some 2000 coke ovens still out of work, and several coking collieries are doing hardly any business.

The Cleveland miners have been asked to submit to a reduction of 1½d. per ton on tonnage rates, and 10 per cent. in other wages. At the present time they are paid 11d. per ton, which is just the same rate as they were paid in 1871, and for some years previously. But the mineowners declare that trade is much worse now than it was then—some of them even maintaining that it never was so bad. The miners are to hold a council meeting at Saltburn, on Saturday, to consider the proposal of the owners; and on Monday they will meet the owners at Middlesborough, and give in their answer. It is expected that the matter will be referred to arbitration, as previous proposals of the same kind have been. The Cleveland miners have, as a rule, been much more regularly employed than the coal miners during the past two years. Whether they will continue to be so is at least very doubtful. The mineowners have in some cases accumulated large stocks of ironstone, and so have the owners of blast-furnaces. A great deal will depend upon whether the working cost can be so far reduced as to lead the owners of blast-furnaces to keep them blowing. So far as present appearances go, there is little hope that this can be done. The prices of pig-iron are falling every week, and at no time within the last ten years could that commodity be purchased for less money than at the present moment.

There is a very unhappy sameness from week to week about the reports of the Middlesborough iron market, and this week has been no exception to the rule of the last two months. The universal complaint is that there is nothing doing, and that prices continue to come down. On Tuesday business was actually done on Middlesborough Exchange at 41s. per ton for No. 3, although the nominal quotation was 42s. 6d., and some strong makers refused to sell even at the latter figure. Several pig-iron makers did not hesitate to declare that rather than come any lower they would blow out their furnaces, because, terrible as the latter alternative must be, it could hardly be worse than the other, a heavy loss being inevitable in either event. It has been expected that the clearing up of the Eastern complications and the opening up of the spring navigation would stimulate demand, but neither of these causes have hitherto exercised any appreciable effect. The main demand is from home sources—Wales, Scotland, and other parts of the United Kingdom—taking more and more of our Cleveland iron and making less for themselves. The stocks of pig-iron now in makers' hands is larger than it has ever been in Cleveland before, and hence the prospect of a revival is rendered all the more remote.

The Darlington Iron Company has issued its fourth annual report. The directors state that there is a balance of profit on last year's working of 2525*l.*, whereby the loss incurred in 1875 has been reduced to 9642*l.* The report states that the manufacture of shipbuilding iron has been undertaken by the company, and satisfactory orders for this class of iron are now on the books. The directors look forward to an improvement of trade by a peaceful settlement of the Eastern Question.

The workmen employed in the shipbuilding yard of Messrs. Gray and Company, Hartlepool, have made application for an advance of wages, which, however, is little likely to be conceded, seeing that there is still a great deal of dulness in some of the yards in the North, and the prospects of this trade are not quite so good as they

were some time ago. No further steps have been taken in reference to the wages movements on the Tyne.

Several of the Northumberland steam coal collieries are about to be laid off. At Throckley Colliery the men have received notice to terminate their engagements, and at Heddon Colliery operations have been suspended on account of slackness of trade. At Plasketts Colliery, which has been laid idle for some days in consequence of a dispute, work has just been resumed.

REPORT FROM THE FOREST OF DEAN.

March 22.—We have to repeat "the old, old story"—that trade and labour are still very dull. The improvement which some profess to have seen, and to see, is so slight and irregular that many deny its existence, and declare that things are even getting worse. For ourselves, however, we fully believe that some improvement has come to the district, though by no means equal to what has been represented in some of the public prints. And the said improvement has been very spasmodical and uncertain, to be observed only as "spurts," lasting a few days, and then discontinued for a short time to "spurt" again. Nor has the improvement in question been general throughout the district, but characterising only a few pits and favoured firms. And such is in the main the present state of things. The work is very irregular, and, of course, the output of coal limited, and as coal and iron are staple trades of the Forest it follows that when they are low or stagnant other businesses suffer. And this has been the case to a serious extent. Numbers have found the ordeal so severe that they have felt themselves obliged to have recourse to liquidation, and others are now passing through the same kind of process to save themselves from utter ruin. Yet, in the midst of these discouragements, many profess hope in future revival of trade, whilst some express absolute confidence that the district will at no distant day again flourish. And we have no doubt but that trade in the district will considerably improve, as well as generally throughout the country, but at the same time we feel convinced that strikes have done so much to drive business to other countries that new connections having been formed, and cemented by mutual confidence, we fail to see that England will ever again be "the workshop of the world" in an equal sense to what it has been in the past.

But in addition to the evil effects of strikes, we must take account of the numerous "bogus" schemes and swindle companies which have been concocted to enrich unscrupulous adventurers, and rob unwary capitalists; and from the fact so many have felt the smart from such causes, and made the particulars known, that other capitalists have been afraid to invest. Their confidence has suffered a severe shock. Time, therefore, will be required for the recovery of confidence. The loss of confidence as to the investment of capital, from the causes named, and strikes by workmen, we look upon as the principal reasons for the present general dulness in most trades, manufacturers, businesses, and new adventures of capital. But to return to our district. The officials of the National Confederation of Miners have been making great efforts to revive unionism, but only with small success. A grand mass meeting was called for Thursday of last week, to be held near the Speech House, but instead of 2000 or 3000 workmen attending, as was formerly the case on such occasions, only about 200 rallied to the union standard, notwithstanding that two "big guns" from the North were announced to be let off in fine speeches at the meeting—Messrs. Crawford and Brown. The latter delivered a lengthy speech, in which he attempted to show by much sophistry that, however limited trade in coal might be, coal proprietors and working colliers should combine to keep up prices and wages! He even denied that the coal trade was bad, notwithstanding that men are pretty generally working only part time. Yet, in the very same speech he declared that no combinations could secure good trade; but trade, or next to no trade, they (the proprietors and working colliers) were advised to combine to keep up the prices of coal and wages. We regret, however, that employers and employees cannot always mutually agree to what is reasonable and right by each other, instead of too frequently attempting to steal a march on each other; but human nature is the same all the world over.

The Messrs. Thomas and Co., Lydbrook and Lydney, have had some difficulties with their men, but the disputes have been terminated, and the tin-plate works are now in active operation. Their colliers, too, struck work, and were out a week, but are now again in full employment. This firm has purchased some coal levels at Lydbrook, and are about to open one or two additional tunnels into the hill to the coal seams, having already commenced these preparatory works. And we hope success will crown the investment of capital by a good trade in the article. But, of course, the firm will consume part of the produce in the process of tin manufacture. Mr. G. Russell, also has had a dispute with his workpeople, by proposing to cut off 3d. a turn for removing what is locally called "bull dog," after some alterations at his works; but the matter was amicably settled, on Friday last, by his conceding the amount he had wished to cross off, and all is now proceeding as usual, the men resuming work on Monday. The iron trade is still slack, but the Littledean Woodside Coal Company is now doing a brisk trade in bricks, and they have a large demand for lime and smiths' coal. But the general depression is felt much on the railways around, the Severn and Wye Company complaining, and the Ross and Monmouth Company also complain, of the reduced revenue arising from the reduced tonnage of coal running over their lines.

The Severn tunnel at Port Skewett, and the Severn bridge at Sharpness are proceeding slowly, but we think not with such satisfactory progress as ought to characterise such important works, especially the bridge, as in the opinion of many the opening of it when completed will very beneficially influence the trade of the district. This, undoubtedly, is the opinion of the directors of the Bridge Company themselves, or they would never have projected the scheme; therefore, their own interests as well as the Forest interests, point to the desirableness of the works being completed. Why, then, do they not push on the contractors in every possible way? Only ten spans are up, so that unless they press forward faster than at present the summer will be here and gone again, and the most difficult spans (arches) be still far from being finished. Why are not more men employed?

THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week the market has continued very dull. In shares of iron and coal concerns, Shotts are reduced 20s. per share, Ebbw Vale 7s. 6d., and Monkland (ordinary) 3s. A meeting of Bolckow, Vaughan, and Company will be held on March 27; B shares are quoted 38 to 39, and no alteration on A shares, although sellers might accept less. Nant-y-Glo and Blaina (preferred) are wanted about late rates, but the deferred are offered at 6s. Andrew Knowles and Sons are at 2s. 6d. to 7s. 6d. prem. Ashbury Carriage and Iron Company, 39 to 35 dis. Bilbao Iron Ore, 24 s. Cardiff and Swansea, 37s. 6d. to 42s. 6d. Crown Preserved, 50s. to 60s. Great Western, 4 to 6. Llynvi, Tondu, and Ogmore, 15 to 17. Mersey, 27s. 6d. to 29s. 6d. dis. Newport Abercarn, 60s. to 70s. New Sharlston (preference), 80s. to 85s. North of England Industrial Coal and Iron, 7½, sellers. Pelsall, 10½ to 10 dis. Rhondda Merthyr, 10 to 15. Rhymney (new), 6 to 6¼. Scottish Australian, 37s. 6d.; and new, 6s., buyers. Sheepbridge, 6 to 5½ dis. Staveley, A, 29 to 30; ditto, C, 89 to 90. South Wales, 8 to 9. Tredegar, A, 16 to 17. West Mostyn (preference), 50s. to 70s. In shares of foreign copper concerns, Canadian Pyrites are 6d. lower. Tharsis have improved 18s. 9d. on new shares and 6s. 3d. on old shares on favourable dividend rumours; old shares touched 21⅝ yesterday, and the new 15. Huntington are also 1s. 6d. higher, at 21s., but a trifle less might now be accepted. Yorke Peninsula are at 5s. to 10s. for ordinary, and preference about 20s.

In shares of home mines there is still very little to do. Glasgow Caradon, old and new, unaltered. South Condurrow shares are in good demand and improved, at 7l. 1s. 3d. to 7l. 3s. 9d. Talargoch Lead offered. It is said the reduction observable on some of the lead shares is owing to the expected failure of a smelting firm. Bampfylde are at 7s. 6d. to 10s. Cargoll, 90s.; East Lovell, 2s.; Leadhills, 6¼ to 6½; Monydd Gorddu, 70s., sellers; Mwyndy Iron Ore, 35s. to 45s.; North Laxey, 14s. to 17s.; Parys Mountain, 8s. to 9s.; Van Consols, 47s. 6d. to 50s.; West Tankerville, 30s. to 35s.; Wheal Grenville, 12s. 6d. to 17s. 6d. In shares of gold and silver mines Flagstaff have fallen 7s. 6d., and Richmond 2s. 6d.; the week's run on the latter is 3000 better, being 356,000. Emma shares have not been dealt in, but a slight reduction would, no doubt, be submitted to from last price. Advices from Chontales Mines for the month ending Feb. 5 last show a loss of 119l., and the mines are said to be poorer. Javali advices, dated a day after the above, are 40l. profit for 23 days' working. I. X. L. are wanted at 17s. 6d., and South Aurora at 8s. 3d. Santa Barbara have been done at 36s. In shares of oil concerns improvements of 2s. 6d. on Young's Paraffin and 6d. on Oakbank are all the alterations. In shares of miscellaneous companies another substantial advance (50s.) on London and Glasgow Engineering is the principal feature. It is noted that the shipbuilding is the only active trade in the West of Scotland at present, and some view this as preparations on the part of our Government for a war in the future. Scottish Wagon, both classes of shares, are reduced 2s. 6d., but there are buyers over of the old shares at this reduction. Bede Metal and Chemical are 18 discount. Earl's Shipbuilding, 12; Hopkins, Gilkes, and Co., 7¼ to 7¼ dis.; Lancaster Wagon, 50s. to 60s. (ex div.); Langdale's Chemical, 77s. 6d. to 80s.; Lawe's Chemical, 6¾ to 7; Milner's Safe, 9¼ to 10; Newcastle Chemical, 90s. to 85s. dis.; Phospho Guano, 10½ to 11.

HOLMBUSH (Limited).—Some parties are speaking very favourably of this mine at present, which issues monthly accounts, and has paid two monthly dividends at the rate of 30 per cent. per annum. The trading account for February last shows (excluding shillings and pence) the costs paid at 1727l., produce realised 1478l., but there are also credits of 197l. balance of previous account, and 732l. costs and subsists charged and repaid in accounts of tributers and others. A sum of 91l. is debited as contribution to sinking fund for redemption of capital accounts, &c. The quality of the ore produced is the best known as regards arsenic, says the report accompanying the accounts, and increased reserves of ore to an extent more than commensurate with the ground exhausted during the month have been opened up. A lead lode has been reached, where it is expected ore will be found. This all reads very well, but it is doubtful if it is reasonable to expect a new company to continue paying dividends at this rate, especially monthly. The system of issuing monthly accounts, which should be properly authenticated, is good if it can be kept up.

UNITED BITUMINOUS COLLIERIES COMPANY (Limited).—It may be of some interest to know what is being done by the official liquidator of this concern. A careful examination of the books and accounts of the concern apparently show results of a serious nature against the parties liable. Chancery proceedings have been taken against several parties for payment of money on shares alleged to have been illegally received by them as bribes from the vendors. Proceedings have been taken against the brokers. An action has also been carried out against one of the directors for removing a portion of the plant from the company's property, and a portion so removed has been recovered. The plant, &c., of the Pwlly Danen Colliery has been obtained, subject to payment of dead rent. In addition, money said to have been received and not paid over by the late secretary is being pressed for. We are not aware if any but original shareholders have power to act in a matter of this sort, but if, on the contrary, existing shareholders have, and they are satisfied of the commercial standing of the defendants, it will be to their interest to come forward and assist the official liquidator as far as possible.

MONKLAND IRON AND COAL COMPANY (Limited).—At the sixth ordinary general meeting of this company, on Tuesday, the report and accounts were adopted, and the retiring directors and auditors re-elected. Mr. Durham Kippen was elected a director also, the resolution of March 17, 1874, limiting the number of directors to five being rescinded to effect this election. The Chairman said that, all things considered, the report was by far the most satisfactory they had ever been able to submit to the shareholders. Mr. Ferrie's estimate of the result of converting six out of nine furnaces into patent furnaces was that the saving of coal on the make of pig-iron for 1876 had been 46,800 tons, or allowing 9750l. for dross, in all 24,180l.; over and above the fact that they are now using no dross, and owing to an alteration of Mr. Ferrie in the puddling-furnaces, whereby dross was used to puddle with instead of coal in the malleable department, represented upon the make something over 1500l. per annum. J. GRANT MACLEAN, Stock and Share Broker.

Post Office Buildings, Stirling, March 22.

EXTRACTION OF FOUL AIR FROM COAL MINES.

There is an old adage which says that a man who can make two blades of grass grow where only one grew before deserves the thanks of his fellow-creatures. The same appreciation may surely be extended to the man who discovers some method whereby the dangers to which a portion of his brethren are subject while following their daily employment are altogether removed, or at least minimised. The man who is able to accomplish this great desideratum is not only deserving of gratitude but is also worthy of more substantial recognition. The dangers arising from the presence of choke-damp and noxious gas in coal mines are, unfortunately, too well known, from the calamities which they cause, frequently resulting in terrible destruction both of life and property. Scientific men have exerted their energies to discover means whereby these noxious gases in mines may be rendered harmless, but the only sure neutraliser that has been found serviceable is thorough ventilation. The difficulties attendant on securing this object are invariably very great, and oftentimes the least fault has resulted in catastrophe. If better means could be found than the appliances now in use for the ventilation of hazardous mines, and especially the withdrawal of the source of danger, thus enabling the place to be worked in with comparative comfort and without fear of explosion, we feel assured that those interested in collieries would hail the discovery as a boon. An effort in the direction indicated has been made by Mr. JOSEPH EDWARDS, of the Cattle Market Hotel, Chorley, who has, after several months' thoughtful work, designed an apparatus on the pneumatic principle, which seems to possess all the elements requisite for effecting the object in view, and judging from the success which has attended a private trial which we have been privileged to witness, we may say that the invention will, no doubt, command considerable attention from those interested in the safe working of mines. Mr. John Lewis, civil engineer, of Preston, is so thoroughly sanguine of the beneficial results which will accrue in the working of mines by the use of Mr. Edwards's apparatus that he has, at the instigation of the inventor, taken the preliminary steps to patent the invention. Before describing the trial to which the apparatus has been subjected, it will perhaps be necessary to give some description of the appliance. According to the specification of the patent the invention is designed with the object of saving life and property in coal and other mines, by the extraction of the foul air and gases accumulating and confined for the want of a constant current of air, which is obtained by first extracting the foul air or gas, and providing a clear passage for a current of fresh air from the mouth of the mine, and this being constant, all danger of fire or explosion is removed. To effect this there should be fixed at the top or bottom of the shaft or entrance to a mine a steam-engine or engines, by which is worked a fan or fans, or exhaust or vacuum pipes. From these are carried perfectly air tight exhaust pipes, branched to any part of the working in the mine where the apparatus is fixed. At the bottom of the shaft is carried a delivery pipe, considerably larger than the suction up the shaft, and outside the pit a natural current of pure air from the mouth of the pit takes the place of the foul matter extracted. Should not such be the case to the extent required by the rapid accumulation of foul air or gases, similar fans or force pumps are placed to draw the pure air from the mouth of the pit into the workings, and a main suction pipe is carried in the main gangway of the mine, from which are branches to the workings right and left, and where convenient, at the top of such gangways, suspended with the main pipes are placed mid feathers to guide the current. The mouths of the suction pipes are belled for extracting in all branches, and for pure air delivery. The deliveries are also belled, so that in the suction it has a free ingress to main suction pipe, and in delivery a spreading egress to all parts of the workings. The before mentioned mid-feathers are to keep the several draughts from coming in contact and interfering with each other. To each of these branch suction or delivery pipes, close to the mains, a door or valve is placed, so that should any of these side workings be stopped, or worked out, or not required from any other cause, its connection is cut off until required again. If such connections are made for the pure air only, the action and mid feathers are reversed, and instead of being suspended at the top of the gangway are to be laid on the floor, leaving sufficient room to carry on the work. By those means the managers or underlookers will have full control over the ventilation of the mine. Such is the means whereby a thorough ventilation of the mine is to be effected. The apparatus was tried for the first time on Wednesday last, in the presence of a numerous company, in the yard of the Cattle Market Hotel. The coach-house, which is a commodious building at the rear of the premises, had been fitted up by Mr. Edwards with the necessary pipes which were attached to a couple of large fans erected in the yard, the motive power being supplied by a large traction engine. The piping is made of galvanized sheet iron. That intended for the extraction of the foul air was placed near the top of the house, and had at each end a large bell mouth, while the pipe for the infusion of the fresh air was placed a few inches from the ground. The spacious building was filled with smoke, caused by the burning of brimstone, and various kinds of refuse, and so dense was it that gas lights were quite imperceptible at the distance of a yard, and only the most daring of persons could venture to stop in the interior beyond a minute or two without suffering the pangs of suffocation. The engine was then started, and within ten minutes the building was exhausted of the noxious vapours, whose place was taken by a purer atmosphere. The success of the invention was demonstrated by further trials on Thursday and yesterday, and there is every reason to hope that the apparatus will achieve all that its inventor claims for it. Mr. Lewis, patent agent, was especially pleased with the result, which he intimated had exceeded his most sanguine anticipation. Of course, in connection with an apparatus of this kind, an important point for consideration will be its cost, and with regard to this matter we are assured that it will be relatively small in comparison with the beneficial results to be obtained from its adoption—especially in mines which are of a notoriously fiery nature.

The experiments were continued on Saturday, and were witnessed by a large number of persons, and many of whom are interested in the safe getting of coal. The general opinion expressed was that the invention was a most useful one, and if introduced into dangerous mines would render them safe. The inventor, in fact, is so sanguine of the practicability of the apparatus that he avers that were it fixed in gaseous mines naked lights may be used without fear of explosion resulting.—*Chorley Standard.*

THE TYLDESLEY COLLIERY EXPLOSION.—The inquest on the bodies of the seven men killed at the Great Boys Colliery, Tyldesley, was concluded on Friday before Mr. Edge, coroner. It was admitted by all parties that the explosion was caused by the firing of a shot which failed to do its work in the place of John Yates, in the east workings. Yates said he fired the shot, having had authority from Robinson, the shot lighter, to do so whenever he considered it was safe. Other colliers swore that they fired shots at discretion without any orders from the shot lighter appointed under the Act of Parliament, which requires that the shot lighter shall examine the place immediately before the fuse is lighted. The manager, Mr. Howell, and Johnson, the underlooker, denied that the irregularity was connived at by them, or that they ever heard of it. One of the colliers declared that he had batted gas away with his shirt while the fireman was applying a light to the fuse.—Mr. Dickinson, Government Inspector, said the day after the explosion he made a thorough examination of the mine at three points. In his opinion John Yates's place became so charged with gas that the firing of the shot caused the explosion. He did not believe a blown-out shot would have caused all the destruction he saw, unless there had been gas in the air. On the day of the explosion there was a considerable fall in the barometer. He believed the use of cartridges was often the cause of blown out shots. The jury returned the following verdict:—"The jury are unanimously of opinion that these deaths were caused by a blown-out shot; and they are of opinion that the mine has been badly managed, and that the managers are all to blame for not providing a sufficient staff of men to carry on the works according to Act of Parliament."

In the House of Commons on Thursday Mr. Cross stated, in reply to Mr. Macdonald, that he had not yet received the exact terms of the finding of the jury who investigated the Tyldesley explosion case. That finding would, however, reach him in the course of a day or two. He thought it was in the interest of all parties, both employers and employed, that a prosecution should issue according to the finding of the coroner's jury, and, therefore, all persons implicated with that finding would have proceedings taken against them. He did not think it right that the Secretary of State should take proceedings against any persons connected with the mine that would prejudice the proceedings taken in consequence of the finding of the coroner's jury. When the prosecution was over he could state what would be done.

COLVERD'S PATENT CARRIAGE POLE HEAD.—An invention is announced which promises to be exceedingly useful to carriage locomotion. It is called Colverd's Patent Carriage Pole Head. Its utility is threefold. It gives the driver more certain control of his horses, secures them in a considerable degree from falling, and in case one of them does fall the animal can be immediately released, averting the kicking and plunging which so often occasions injury to the horse which remains upright, and damage to the vehicle, occasioning it may be serious loss to the proprietor. The patented article may be described as in construction one of simple complexity. Any apparent complications are the result of carrying out a very simple principle in an effectual manner. This pole head is of metal—probably brass is preferable to any other metal single or mixed—and it is fixed on the end of the carriage pole, and completely under the control of the driver by medium of the reins. A model of a carriage and horses, with the new patent pole head affixed, showing very beautifully its working, stands in the office of the patentee's agent, Mr. F. H. Vandyke, of 1, St. Swithin's-lane, where it may be seen any day. It is well worthy of a visit from the curious in patents and inventions, from philanthropists and lovers of animals, and most especially from those who have property in carriages and draft horses.

ECHOES FROM THE MINING MARKET.

The announcement of the difficulties of a smelting firm who have been rather extensive buyers of the ores of several of our lead mines, has had a prejudicial effect upon the prices of those interested. The principal sufferers appear to be Van, Great Laxey, Grogwinion, Wye Valley, West Wye Valley, Roman Gravels, Assheton, and Dyffin. Of course, the effect of this failure can be but temporary, and probably, in the majority of cases, will only only lead to a reduction in the next dividend. With regard to Roman Gravels, however, we understand the payment of the dividend will have to be postponed. Apart from this circumstance the market has been without any feature of importance, and changes have been few and unimportant in character. In foreign shares an advance has taken place in Exchequer, owing to the receipt of a telegram stating that the mill and furnaces were started on Saturday last, and all running well. In the early part of the week North Laxey were freely offered, but close firmer on a better report at 15s. to 17s. 6d. Great West Van is said to be looking well, and at the 46, west of Eliza's shaft, there are appearances of a good run of lead. At Clementina the lode in the shaft is producing ½ ton of lead per fathom, and the mine is improving. There has been no change whatever at Sun Van, and the shares are dull at 7 to 7¼. But "market operations" soon alter the quotation of these shares. A good deal of interest is taken in the progress of the bottom level in East Chiverton, and it is hoped that soon a rich bunch of lead will reward the exertions of the adventurers. At Van Consols the sinking of the drawing shaft has been resumed in a fine lode for lead. A few transactions have taken place in Llanrwst, at ⅛ dis. to par (1¼ to 2).

There is still no change in tin. Shares are consequently dull, although a steady business is doing in two of the low-priced ones—Cathedral and Penstruthal. South Condurrow have improved in price. We receive favourable accounts of Wheal Agar. The loss on the month will scarcely amount to 40l., and when the burning-house has been erected a good saving will be effected. The mine, however, urgently requires efficient stamping power, and we hope the shareholders, who have already shown such confidence in the future of their property, will before long see their dressing floors complete, as loss must always be incurred by selling tin in the stone. The adventurers were purchasers at the late sale of materials at the Crenver and Abraham Mines. At East Pool a dividend of 2s. per share has been declared. We understand that both Cathedral and Penstruthal are looking exceedingly well. Tincroft is going on comfortably, and the stopes are yielding their usual quantities of tin. But for the bad system of keeping accounts in vogue here the shares would probably be more in request. As it is, the debits are far behind the credits; and the same is to be said of Dolcoath and Carn Brea. The latter mine has a rich lode in the Highburrow east shaft, worth 100l. per fathom.

In copper shares there has been a good rise in We t Seton, in consequence of an improvement in the 150 fm. level. The end will yield about 8 tons of ore per fathom. Parys Mountain have been dealt in considerably during the week, but the closing price shows no improvement. We understand the cross-cut to the south exhibits no change of importance: 240 tons of copper will be sampled this week. Hingston Down have improved to ⅝, ¾, and Bedford United have been in demand at ½ to ¾. JAMES H. CROPER.

HOLMBUSH.—It is reported that the continuation of the shoot of copper ore which yielded such excellent returns to the original adventurers has within the last few days been discovered in the settled ground, immediately west of the workings on the lead lode, by the present company. This, if true, is a fact of great importance, as it is said the lode in the western part of the mine is standing whole to surface.

WHEAL GRENVILLE.—We are informed that it has been decided to have a new 80-in. pumping-engine of Messrs. Harvey and Co., of Hayle. Price, to be delivered in the mine, 1800l. Pitwork will be had of Messrs. Michell and Co., and tenders are to be invited for the supply of all timber.

THE PERRAN IRON MINES.—We recently stated that there was a probability of a new company undertaking the working of these important mines, and we are now informed that some Manchester gentlemen have been induced by Mr. W. R. Roebuck, who was the chief originator of the Cornwall Minerals Railway, to take up these iron mines in a spirited manner.—*West Briton.*

LEAD ORES.

Date.	Mines.	Tons.	Price per ton.	Purchasers.
March 12	Glog'awr	40	£15 4 0	Panther Lead Company.
	Glogfach	18	20 5 0	ditto
	East Darren	40	18 0 0	ditto
19	Great Laxey	100	23 11 0	Nevill, Druce, and Co.
21	Pennerley	50	13 12 6	George Burr.
23	Foxdale	110	21 11 6	Walker, Parker, and Co.

BLACK TIN.

Date.	Mines.	Tons c. q. lb.	Price per ton.	Amount.	Purchasers.
March 14	Pedn an-drea	7 12 1 25	£43 10 0	£331 12 7	Trethellan.
15	ditto	7 19 2 12	43 10 0	347 3 0	ditto

PERUVIAN TIN ORE SOLD IN LIVERPOOL on March 21. Messrs. Bolitho and Sons purchased 7½ tons, at £40 12s. 6d. per ton.

COPPER ORES.

Sampled March 7, and sold at the Royal Hotel, Truro, March 22.

Mines.	Tons.	Price	Mines.	Tons.	Price
Devon Great Consols	91	£6 1 0	Marke Valley	30	£4 9 0
ditto	85	2 3 6	Gunnislake (Clitters)	80	5 2 6
ditto	83	2 5 6	ditto	74	4 16 6
ditto	79	2 3 0	ditto	73	6 5 6
ditto	70	6 12 0	ditto	70	4 5 6
ditto	66	2 8 6	Glasgow Caradon	64	3 11 6
ditto	58	5 14 0	ditto	63	4 3 0
ditto	57	5 1 6	ditto	61	5 0 6
ditto	56	2 3 6	ditto	52	5 7 6
ditto	54	2 2 0	Hingston Down	71	3 8 6
ditto	51	4 17 0	ditto	70	3 5 0
ditto	42	2 3 6	ditto	47	2 14 0
ditto	28	2 1 6	Brookwood	55	2 9 0
South Caradon	90	4 2 6	ditto	50	2 17 0
ditto	89	4 6 0	ditto	42	2 17 0
ditto	74	6 16 6	ditto	38	5 5 6
ditto	61	9 15 6	Bedford United	99	4 7 6
ditto	57	9 15 6	ditto	66	3 18 6
ditto	50	4 8 6	East Caradon	58	3 12 0
ditto	43	4 6 6	ditto	57	4 7 6
Marke Valley	76	3 5 6	West Maria & Fortescue	81	2 8 6
ditto	75	3 1 6	ditto	23	1 17 6
ditto	55	3 4 6	Wheal Russell	70	2 2 0
ditto	54	2 18 0	Wheal Emma	40	2 4 6
ditto	42	3 3 0	Okel Tor	10	1 13 6

TOTAL PRODUCE.

Devon Great Con.	820	£2958 2 6	Bedford United	156	£652 16 0
South Caradon	470	2846 4 6	East Caradon	115	458 3 6
Marke Valley	330	1073 10 0	West Maria, &c.	104	239 11 0
Gunnislake (Clit.)	297	1522 7 6	Wheal Russell	70	147 0 0
Glasgow Caradon	240	1076 5 6	Wheal Emma	40	89 0 0
Hingston Down	188	593 9 0	Okel Tor	10	16 5 0
Brookwood	185	711 8 0			

Average standard ..... £103 19 0 | Average produce 6¾
Average price per ton £4 2 0
Quantity of ore ..... 3025 | Quantity of fine copper 199 tons 4 cwts.
Amount of money £12,384 2 6
LAST SALE.—Average standard ..... £101 9 0 | Average produce 6¾
Standard of corresponding sale last month, £106 2 0—Produce, 6¼

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Vivian and Sons	578½	£2406 19 6
Grenfell and Son	514½	2 32 9 0
Nevill, Druce, and Co.	451½	1889 13 9
Williams, Foster, and Co.	282	1179 18 9
Mason and Elkington	522	1921 19 3
Charles J. Lambert	488	2174 1 0
Sweetland, Tuttle, and Co.	188½	499 1 3
Total	3025	£12,384 2 6

NO SALE on Thursday next, March 29.

Copper ores for sale at Tabb's Hotel, Redruth, on Thursday week—Mines and parcels.—West Tolgus 350—West Seton 302—South Crofty 150—East Pool 113—Wheal Basset 88—Carn Brea 67—West Basset 49—Penstruthal 45—West Polden 33—Cathedral 30—Wheal Comford 21—Pedn an-drea 7—East Basset 7—South Tolcarne 4—Wheal Seton 4.—Total, 1269 tons.

FOR SALE, at NEW PEMBROKE MINE, near PAR STATION, CORNWALL,
An excellent 80 in. cylinder PUMPING ENGINE, 12 ft. stroke in cylinder and 11 ft. in shaft, with cast-iron balance bob, and FOUR 12 ton BOILERS, in good condition.
ONE 25 in. DRAWING ENGINE, and TWO BOILERS.
ONE 20 in. STAMPING ENGINE, with three iron stamps' axles, carrying 6 heads, and TWO BOILERS.
Also, OTHER GOOD MINE MATERIALS.
Apply to—
MR. JOHN POLKINGHORNE, PAR OFFICE, PAR STATION.

ON SALE:—
ONE 70 in. cylinder single acting PUMPING ENGINE.
ONE 30 in. ditto ditto
ONE 22 in. WINDING ENGINE.
ONE 18 nominal horse power PORTABLE ENGINE.
Several CORNISH BOILERS, PITWORK, STRAPPING PLATES, CAPS, &c., and various other spare MINE MATERIAL. Also, one large BALANCE BOB.
Apply to—
WILLIAM TREGAY, REDRUTH, CORNWALL.

BOURNE'S PATENT

Balanced High-Speed Engines.

The Best and Cheapest Small Steam Engines made.
SIMPLE, LIGHT, COMPACT, DURABLE, AND VERY ECONOMICAL IN FUEL.
Prices per actual horse power:—

4 horse power	£16 0 0	30 horse power	£48 0 0
8 "	22 0 0	40 "	57 0 0
12 "	28 0 0	50 "	65 0 0
20 "	34 0 0	70 "	76 0 0
	90 horse power £88 0 0		

Governors and feed pumps extra. Boilers equally moderate.
Testimonials of performance on application.
JOHN BOURNE AND CO., ENGINEERS,
66, MARK LANE, LONDON.

VIRNEBERG COPPER MINING COMPANY. LIMITED.

Registered under the Companies Acts, 1862 and 1867, whereby the liability of shareholders is limited to the amount of their shares.
Capital £100,000, in 50,000 shares of £2 each.
Payable—5s. on application, 5s. on allotment, balance as required.
Calls not to exceed 10s., and at intervals of not less than 2 months.
DIRECTORS.
MR. Alderman HADLEY, Sheriff of London and Middlesex.—CHAIRMAN.
TUFNELL S. SOUTHGATE, Esq. (Chairman of the Roman Gravels Mining Co., Limited), King's Bench Walk, Temple, London.
THOMAS DICKINS, Esq., J.P., Higher Broughton, Manchester.
WILLIAM KEITH, Jun., Esq., King Street, Aberdeen,
ROBERT JOHNSON, Esq., Park Villa, Romford, Essex; and Grace-church-street, London.
EDWARD HILTON, Esq. (Director of the Grogwinion and Wye Valley Mining Companies, Limited), Radfield, Clapham Park.
BANKERS.
The LONDON AND SOUTH-WESTERN BANK (Limited), Fenchurch-street, London.
BROKER.
JOHN GIBBS, Esq., 51, Threadneedle-street, and Stock Exchange, London.
SOLICITORS.
A. D. SMITH, Esq., 31, Great James street, Bedford-row, London.
CHARLES KEARSLEY, Esq., 26, Brazennose-street, Manchester.
SECRETARY—THOMAS R. CLARKE.
OFFICES—86, LONDON WALL, LONDON, E.C.

NOTICE IS HEREBY GIVEN, that the LIST of APPLICATIONS for SHARES in the above-named company will be CLOSED on SATURDAY, the 7TH APRIL proximo.
London, March 23rd, 1877. By Order.

THE

PERKINS BEACH LEAD MINE

(LIMITED).
Capital £30,000, in £1 Shares,
Of which 10,000 are now offered for public subscription.
Five Shillings per share payable on application, and the remainder in similar instalments at intervals of two, four, and six months.
DIRECTORS.
W. H. PERKINS, Esq., Director of the Tower Subway Company, 65, Sutherland Gardens, Bayswater.—CHAIRMAN.
The Right Hon. Lord FRANCIS G. GODOLPHIN OSBORNE, 19, Chapel Street, Park Lane.
General CHESNEY, R.E., 58, Netherwood Road, West Kensington Park.
F. A. CODD, Esq., Paymaster R.N., 92, Guildford Street, Russell Square.
E. TALBOT, Esq., C.E., Carnforth, Lancashire.
BANKERS—UNION BANK OF LONDON.
OFFICES.
7, UNION COURT, OLD BROAD STREET, LONDON.

This company is formed for the purpose of purchasing, working, and developing the Perkins Beach Lead Mine, situate at Minsterley, near Shrewsbury, the centre of the celebrated Shropshire lead mining district.
The property is bounded on all sides by well known and productive mines, all of which have made very large returns to their shareholders.
Immediately adjacent, and to the west, lies the Tankerville Mine, which has yielded dividends to the amount of £49,800 since 1870. On the north-west the property is bounded by the Roman Gravels Mine, which has returned £69,600 in dividends in the last five years. To the east is the celebrated Old Snailbeach Mine, which has been at work for the last 100 years, and paid dividends amounting to £300,000.
The engine shaft has been sunk 70 fms., and the principal lodes run parallel with those of the Snailbeach and Tankerville Mines adjoining.
The mine has already produced lead to the value of £35,000. Although now worked on a limited scale, it makes ready returns of rich ore, and the workings have nearly reached that depth at which the whole of the above-named successful mines in the neighbourhood began to make large profits.
Experience has shown that lead mines are preferable as investments to mines producing other metals.
In further demonstration of this view, it may be stated that the aggregate market value of the shares of the principal lead mining companies exhibits a premium on the paid-up capital of about 300 per cent.
The only contracts which have been entered into are the following:—An agreement dated the 8th day of February, 1877, between William Howell Preston of the one part, and the Perkins Beach Lead Mine (Limited), of the other part; and an agreement dated the 2nd day of November, 1876 between Cresswell Watson Noble of the one part, and William Howell Preston of the other part.
Prospectuses, reports, and Forms of Application for Shares can be obtained at the offices of the company, where samples of ore may be seen, and orders to view the mine obtained.

ADVERTISING.

C. H. MAY AND CO.,
GENERAL ADVERTISING OFFICES,
78, GRACECHURCH STREET, LONDON, E.C.
ESTABLISHED 1846.
ADVERTISEMENTS received for insertion in all NEWSPAPERS, &c.

GEOLOGY.—SIX ELEMENTARY LECTURES, adapted to a juvenile audience, will be given by Prof. TENNANT, at his residence, 149, Strand, W.C., in the Easter Holidays, April 2, 3, 4, 5, 6, 7, at 10 A.M. and 3 P.M. Terms, Half-a Guinea for the course. Prof. TENNANT will probably afterwards repeat Elementary Lectures on Mineralogy given during last Christmas holidays.

MR. R. TREDINNICK is a BUYER of Turkish, Egyptian, Russian, and Spanish Bonds, London and Westminster, London and County, and other Bank and Mining Shares. Dealers in Government, Industrial, and Miscellaneous Securities. Financial agency investors confidently advised by appointment.
A selected List of Securities given gratuitously to investors upon application.—81, Bishopsgate-street Within, London, E.C.

CAPTAIN ABSALOM FRANCIS
MINING AGENT, ENGINEER, AND SURVEYOR
GOGINAN, ABERYSTWITH,

In the Court of the Vice-Warden of the Stannaries. Stannaries of Cornwall.

IN the MATTER of the COMPANIES ACT, 1862, and of the BOSWORGEY MINING COMPANY.—ALL CREDITORS or CLAIMANTS of the above-named company, who have not received notice from the Official Liquidator thereof that their claims have been already admitted, are hereby required to COME IN and PROVE their SEVERAL DEBTS or CLAIMS, at the Registrar's Office, Truro, on Thursday, the 29th day of March instant, at Eleven o'clock in the forenoon; or, in default thereof, they will be EXCLUDED from the BENEFIT of any DISTRIBUTION made before such proof. And for the purpose of such proof they are to attend in person, or by their solicitors or competent agents, at the time and place above mentioned.
FREDERICK MARSHALL, Registrar.
Dated Registrar's Office, Truro, the 16th day of March, 1877.

In the Court of the Vice-Warden of the Stannaries. Stannaries of Cornwall.

IN the MATTER of the COMPANIES ACTS, 1862 and 1867, and of the WHEAL CARDELL MINING COMPANY.—By direction of His Honor the Vice-Warden, notice is hereby given that, on SATURDAY, the 7th day of April next, at the Registrar's Office, at Truro, in the county of Cornwall, at Eleven o'clock in the forenoon, this Court will PROCEED to MAKE a CALL of NINE POUNDS and TEN SHILLINGS PER SHARE on all the contributories of the said company settled on the List of Contributories as present members thereof. All persons interested therein are entitled to attend at the time and place aforesaid to offer objections to such call.
JOHN HENRY HAMLEY, Official Liquidator.
Dated Stannaries Court Office, Truro, March 17th, 1877.

In the Court of the Vice-Warden of the Stannaries. Stannaries of Cornwall.

IN the MATTER of the COMPANIES ACT, 1862, and of the EAST WHEAL BASSET MINING COMPANY.—Notice is hereby given, that a PETITION for the WINDING UP of the above-named company by the Court was, on the 17th day of March instant, presented to the Vice-Warden of the Stannaries by George Houghton Arnall, of Redruth, within the said Stannaries, timber merchant, a shareholder, and claiming to be also a creditor of the said company, and that the said petition is directed to be heard before the Vice-Warden, at the Law Institution, Chancery Lane, London, on Tuesday, the 10th day of April next, at half-past Three o'clock in the afternoon.
Any contributory or creditor of the company may appear at the hearing and oppose the same, provided he has given at least two clear days' notice to the petitioner, his solicitors, or their agents of his intention to do so, such notice to be forthwith forwarded to P. P. SMITH, Esq., Secretary of the Vice-Warden, Truro.
Every such contributory or creditor is entitled to a copy of the petition and affidavit verifying the same from the petitioner, his solicitors, or their agents, within 24 hours after requiring the same, on payment of the regulated charge per folio.
Affidavits intended to be used at the hearing, in opposition to the petition, must be filed at the Registrar's Office, Truro, on the 7th day of April next, and notice thereof must at the same time be given to the petitioner, his solicitors, or their agents.
HODGE, HOCKIN, AND MARRACK, Truro, Cornwall (Petitioner's Solicitors).
GREGORY, ROWCLIFFES, AND RAWLE, 1, Bedford-row, London (Agents of the said Solicitors).
Dated Truro, 20th March, 1877.

IMPORTANT SALE of valuable STEEL and WIRE WORKS, COTTAGES, and LANDS, situate at NEWTON HEATH, near MANCHESTER,
By order of the Trustee in Liquidation.

MESSRS. T. H. CALDERBANK AND SON WILL SELL, BY AUCTION, on Tuesday, the 27th day of March, 1877, at the Clarence Hotel, Spring Gardens, Manchester, at Four for Five in the afternoon, subject to conditions, and in the following lots:—
LOT 1.—All those VALUABLE and EXTENSIVE STEEL and WIRE WORKS, in Hulme Hall-lane, Newton Heath, near Manchester, known as
THE MANCHESTER STEELWORKS,
Together with the STEAM ENGINES, STEAM BOILERS, ROLLING MACHINES, and all other FIXED MACHINERY whatsoever in or about the same.
The works are very substantially erected, on a site containing 76:2 square yards or thereabouts, held for the residue of a term of 99 years, from the 16th day of April, 1840 (except the last day thereof).
This lot will be sold subject, as to 5404 square yards thereof, to the payment of a yearly rent of £45 0s. 8d., reserved by and to the performance of the lessees' covenants, contained in an Indenture of lease thereof, dated the 20th day of August, 1841, and made between Ann Dyson Holland of the one part, and John Higgins, James Higgins, and Alfred Norton of the other part, and subject as to 2208 square yards thereof, to the payment of a yearly rent of £23, reserved by and to the performance of the lessees' covenants, contained in an Indenture dated the 31st day December, 1844, and made between William Russell Lucas and George Dyson of the one part, and the said Alfred Norton, John Higgins, and James Higgins of the other part.
The WORKS comprise—EIGHT CONVERTING FURNACES, SIX CRUCIBLE MELTING FURNACES, crucible makers' shop, helve and steam cogging and forging hammers, rolling mills for cogging ingots and rolling heavy spindle steel, mill for mule spindle steel, small rod mill, wire rod mill, capable of rolling 50 tons of wire rods per week, 4 tilt hammers, file forges, file grinding, cutting, and hardening shops and store, benches and gear for 24 blocks, and for wire drawing, with annealing ovens, scouring and cleaning tanks and floors, and drying stove, wire flattening and tempering shop, smiths' shop, carpenters' and mechanics' shop, steam engines, boilers, injectors, furnaces, shearing machines, weighing machines, and iron floor plates, canal wharf, offices, watchman's house, and entrance lodge.
The above are now in work, and have been carried on by the trustee at a fair profit.
The purchaser of this lot will have the option of purchasing the Tools, Fixtures, and loose Machinery in and about the same, and the stock-in-trade now being therein, at a price to be fixed by the Auctioneers.
LOTS 2, 3, and 4 comprise FORTY-NINE COTTAGES and vacant LAND immediately adjoining Lot 1, particulars of which may be had of Messrs. ADDLESHAW and WARBURTON, Solicitors, 67, King-street, Manchester.
A list of the fixed and loose machinery and tools can be seen at the offices of Messrs. ADDLESHAW and WARBURTON, Solicitors, 67, King-street, Manchester.
For further particulars and plans, apply to the Auctioneers, 3, Cooper-street; Mr. T. W. GILLIBRAND, Accountant, 56, George-street; Messrs. SALE, SEDDON, and HILTON, Solicitors, 20, Booth-street; W. L. WELSH, Esq., Solicitor, Brown-street; Messrs. ROWLEY, PAGE, and Co., Solicitors, Booth-street; or to Messrs. ADDLESHAW and WARBURTON, Solicitors, 67, King-street, Manchester.

VALUABLE MINING PROPERTY FOR SALE.
PRELIMINARY ADVERTISEMENT.

THERE WILL BE SOLD, BY PUBLIC AUCTION, within the Chambers of the Liquidator, 115, Wellington-street, Glasgow, on Friday, the 22nd day of June, 1877, at Twelve o'clock noon, the PROPERTY of
THE CONCORDIA COPPER COMPANY,
IN LIQUIDATION,
As situated in Namaqualand, in the Colony of the Cape of Good Hope. The property consists of—(1). The Leases of about 380 acres of Land, containing Five Mines which have been partially worked and explored.—(2). The Buildings at the Mines, consisting of manager's residence, offices, blacksmiths' shops, stables, &c., and three ranges of buildings, containing workmen's houses, stores, &c.—(3). Machinery, consisting of horizontal Engine, water-lift, pumping gear, &c.
The Liquidator is also PREPARED to SELL the office and house furniture, the stores of wood, iron, steel, rope, and mining utensils (the latter amounting as per inventory to about £2000), and the purchaser of the above will have the option of acquiring these at a valuation or otherwise, as may be arranged.
For further information, apply to JAMES MACROBBIE, Liquidator, 115, Wellington-street, Glasgow.

PLUMBAGO MINE AND SLATE QUARRIES.

TO BE SOLD, BY PRIVATE TREATY, ONE-QUARTER SHARE in the BORROWDALE PLUMBAGO MINES, and in HINISTER (GREEN) SLATE QUARRIES, near KESWICK, in the county of CUMBERLAND, and in the PLANT and MACHINERY belonging thereto.
Particulars as to the present state and extent of the mines and quarries, and price required, may be obtained from Mr. N. PEARSON, Accountant, Ulverston, Lancashire.

TO MINE AND QUARRY OWNERS.

TO BE SOLD, SEVERAL ACRES of FREEHOLD LAND, containing an IRON MINE; and a SETTS QUARRY, which produces a stone of excellent quality.
For further particulars, apply to Messrs. BREESE and Co., Solicitors, Pwllheli, Carnarvonshire.

SLATE QUARRY IN WALES.
FOR SALE, BY PRIVATE BARGAIN.

THE NORTHERN WELSH SLATE COMPANY'S QUARRY, "CHWAREL FAWR," situated near CARNARVON, in the centre of the "Bangor Slate Range," at present in full operation, producing excellent slates, and comprising ONE HUNDRED AND TWENTY-FOUR ACRES, leased from the Crown at a moderate royalty.
For particulars, apply to MOORE and BROWN, C.A., No. 166, St. Vincent-street, Glasgow.

APPLEBY IRONWORKS, BRODINGHAM.

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ONE PAIR of 10 in. horizontal WINDING ENGINES.
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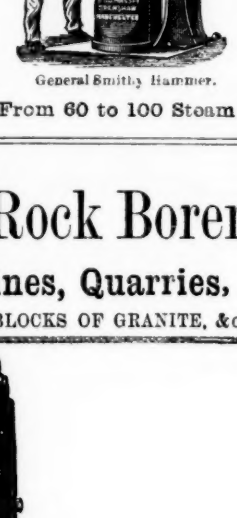

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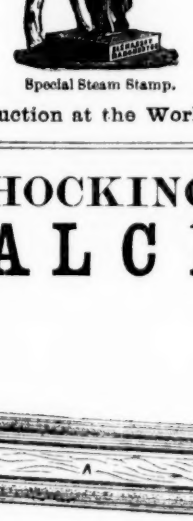

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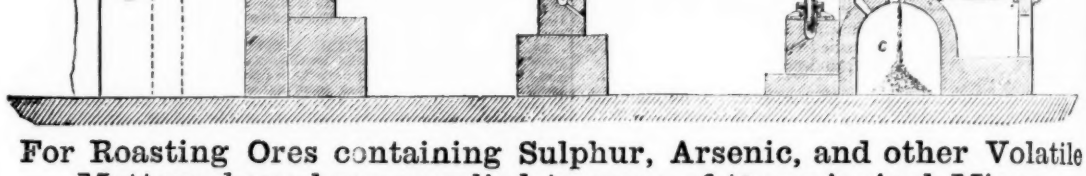

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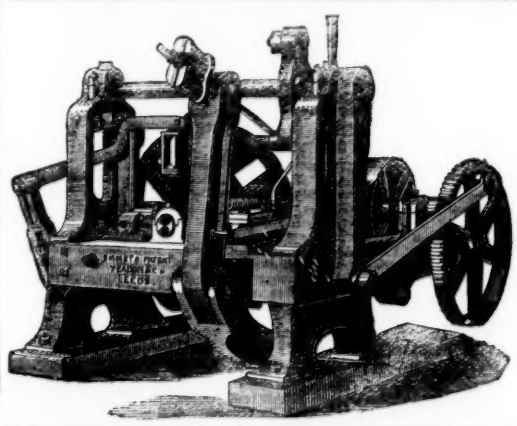

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BRITISH DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
1500	Alderley Edge, c, Cheshire*	10 0 0	—		12 11 8	0 5 0	Jan. 1876
15000	Balmynheer, t, Wendron (4000 to is.)	1 0 0	—		0 2 0	0 2 0	Nov. 1875
30000	Bampfylde, c, i, mn., Devon*	1 0 0	1⅝	1⅜ 1⅝	0 2 0	0 2 0	June 1873
200	Botallack, t, c, St. Just§	119 5 0	30	25 30	619 15 0	5 0 0	Aug. 1872
4000	Brookwood, c, Buckfastleigh	1 16 0	2½	2¼ 2½	3 16 0	0 2 0	Nov. 1875
2000	Bryn Alyn,* l, Denbigh. (10l. sh.)	8 0 0	8½	8 8½	0 7 0	0 7 0	Jan. 1877
5348	Cargoll, s-l, Newlyn§	6 6 0	6	4½ 5	4 16 3	0 12 6	Oct. 1872
6400	Cashwell, l, Cumberland*	2 10 0	2½	2½	1 9 6	0 2 0	Aug. 1876
1000	Carn Brea, c, t, Illogan†§	76 0 0	37	35 37	308 0 0	1 0 0	Feb. 1874
2450	Cook's Kitchen, t, Illogan†§	23 9 9	3½	3 3½	11 17 0	0 7 6	Jan. 1873
10240	Devon Gt. Consols, c, Tavistock†*	1 0 0	4	3½ 4	116 10 0	0 12 0	May 1872
4296	Dolcoath, c, t, Camborne	10 14 10	37	35 37	111 1 3	0 7 6	Jan. 1877
5000	East Black Craig,* l., Scotland	5 0 0	6¼	5¾ 6¼	0 10 0	0 10 0	Feb. 1877
6144	East Caradon, c, St. Cleer†	2 14 6	1½	¾ 1	14 19 0	0 2 0	Oct. 1872
300	East Darren, l, Cardiganshire	32 0 0	—		235 10 0	1 0 0	Aug. 1876
6400	East Pool, t, c, Illogan	0 9 9	11	10 10½	15 0 3	0 2 0	Mar. 1877
2800	Foxdale, l, Isle of Man*†	25 0 0	—		82 5 0	0 10 0	Feb. 1876
40000	Glasgow Cara., c* [30,000 £1 p., 10,000 15s. p.]		1¼	1 1¼	0 12 4	0 0 6	Mar. 1877
15000	Great Dyliffe,* l, Montgomeryshire	4 0 0	4	3 4	0 2 6	0 2 6	Apr. 1876
15000	Great Laxey, l, Isle of Man*	4 0 0	21½	20 21	21 3 0	0 10 0	Jan. 1877
615	Great Retallack, l, bl, Perranzabuloe	5 18 6	1½	1 1½	0 1 6	0 1 6	May 1876
25000	Great West Van, l, Cardigan*	2 0 0	½	⅜ ½	0 2 0	0 1 0	Aug. 1874
6400	Green Hurth, l, Durham*	0 6 0	3	2¾ 3	1 12 0	0 4 0	Oct. 1874
20000	Grogwinion, l, Cardigan*	2 0 0	5¼	4½ 5	0 12 0	0 4 0	Feb. 1877
9830	Gunnislake (Clitters'), t, c	5 5 0	2⅝	2½ 2⅝	0 13 9	0 1 0	Oct. 1876
1024	Herodsfoot, l, near Liskeard†	8 10 0	2¾	2¼ 2¾	62 5 0	0 15 0	Oct. 1872
18000	Hingston Down, c, Calstock*†	1 0 0	⅝	⅜ ⅝	0 1 0	0 1 0	Nov. 1875
60000	Holmbush, a, c, s-l, Callington*	1 0 0	1⅜	1¼ 1⅜	0 1 0	0 0 6	Mar. 1877
25000	Killaloe, sl, Tipperary	1 0 0	—		0 3 11½	0 0 6	Mar. 1873
400	Lisburne, l, Cardiganshire	18 15 0	80	70 80	579 10 0	1 0 0	Jan. 1877
14000	Llanidloes,* l, Montgomery	3 0 0	3	2 3	0 9 0	0 4 6	Nov. 1876
5120	Lovell, t, Wendron	0 16 0	—		0 17 6	0 1 6	Jan. 1874
9000	Marke Valley, c, Linkinhorne	5 0 6	1¼	⅞ 1⅛	7 15 0	0 2 0	Jan. 1876
11000	Melindur Valley, l, Cardigan*	3 0 0	1½	1 1½	0 7 2	0 3 7	Jan. 1875
9000	Minera Mining Co., l, Wrexham*	5 0 0	21	19 21	66 16 2	0 8 0	Feb. 1877
20000	Mining Co. of Ireland, cl, c, l*	7 0 0	5½	5⅜ 5½	23 11 6	0 3 6	Jan. 1876
512	North Busy, c, Chacewater	3 9 6	8½	8 8½	0 10 0	0 10 0	Dec. 1875
10289	North Hendre, l, Wales	2 10 0	—		1 7 6	0 2 6	Dec. 1876
2000	North Levant, t, c, St. Just§	12 2 0	—		4 13 0	0 12 0	Sept. 1873
27855	Old Treburgett,* s-l, ordinary shares	1 0 0	—		0 0 9	0 0 9	Feb. 1874
9258	Old Treburgett,* s-l (10 per ct. pref.)	0 10 0	⅜	⅛ ⅜	0 1 4½	0 0 6	July 1874
5000	Penhalls, t, St. Agnes	3 0 0	2¾	2½ 2¾	3 13 6	0 2 0	July 1875
45793	Penstruthal,* t, c, Gwennap	2 0 0	⅝	½ ⅝	0 2 8	0 0 8	Nov. 1875
12000	Phœnix, & W. Phœnix, t, c, Link.§	3 4 9	4½	4 4½	2 9 6	0 4 0	Nov. 1872
18000	Prince Patrick,* s-l, Holywell	1 0 0	2¼	1¾ 2¼	0 14 0	0 1 3	Jan. 1876
1120	Providence, t Lelant†§	18 6 7	—		104 12 6	0 10 0	Sept. 1872
12000	Roman Gravels, l, Salop*	7 10 0	14	12¾ 13¼	7 1 6	0 8 6	Mar. 1877
512	South Caradon, c, St. Cleer	1 5 0	125	115 125	734 0 0	3 0 0	Jan. 1877
6123	South Condurrow, t,c, Camborne‡	6 5 6	6¼	7 7½	2 6 0	0 4 0	Jan. 1877
12000	St. Harmon,* l, Montgom.	3 0 0	3½	3 3½	0 3 0	0 3 0	Jan. 1877
10000	So. Pr. Patrick,* s-l.(8000 sh. issued)	1 0 0	—		0 1 0	0 1 0	Oct. 1875
12000	Tankerville, l, Salop*	6 0 0	9	8½ 9	4 17 0	0 5 0	Dec. 1876
6000	Tincroft, c, t, Pool, Illogan†	9 0 0	20	18½ 19½	50 3 6	0 5 0	Mar. 1877
15000	Van, l, Llanidloes*	4 5 0	38	36 38	19 19 6	0 18 0	Dec. 1876
3000	W. Chiverton, l, Perranzabuloe†	12 10 0	19	18 19	55 0 0	0 10 0	Jan. 1877
1783	West Poldice, St. Day	10 0 0	13	11 13	1 19 0	0 4 0	July 1876
512	West Tolgus, c, Redruth	95 10 0	61	60 62½	18 15 0	1 0 0	Feb. 1877
2048	West Wheal Frances, t, Illogan	27 13 9	5	4½ 5	3 12 6	0 5 0	Oct. 1872
12000	West Wye Valley,* l, Montgomery	3 0 0	3½	3¼ 3¾	0 6 0	0 3 0	Nov. 1876
512	Wheal Basset, c, Illogan†§	17 2 6	9	7 9	638 10 0	1 10 0	Aug. 1872
1024	Wheal Eliza Consols t, St. Austell	20 0 0	—		10 0 0	4 0 0	Feb. 1877
2048	Wheal Jane, t, Kea	2 13 10	2	1½ 2	8 5 0	0 5 0	July 1875
4295	Wheal Kitty, t, St. Agnes	5 4 6	2½	2 2½	11 19 6	0 2 6	Dec. 1874
80	Wheal Owles, t, St. Just§	86 5 0	140	130 140	522 10 0	4 0 0	Aug. 1872
6000	Wheal Prussia, t, Redruth	2 0 0	4⅞	4½ 4¾	0 3 0	0 2 0	Dec. 1875
25000	Wicklow c, sul, i, Wicklow	2 10 0	2	1⅞ 2	52 9 0	0 2 6	Mar. 1872
10000	Wye Valley, l, Montgomery*	3 0 0	5¾	4¾ 5¼	0 10 6	0 4 6	Oct. 1876

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Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
35500	Alamillos, l, Spain*†	2 0 0	2	1½ 2	1 17 3	0 1 0	Mar. 1877
30000	Almada and Tirito Consol., s*†	1 0 0	½	¼ ½	0 6 3	0 1 0	May 1876
20000	Australian, c, South Australia†	7 7 6	2¼	1¾ 2¼	0 18 0	0 2 6	Aug. 1876
10000	Battle Mountain,* c, (6240 part pd.)	5 0 0	—		0 10 0	0 10 0	Nov. 1872
15000	Birdseye Creek, g, California*	4 0 0	⅞	¾ ⅞	0 14 0	0 2 6	June 1874
12320	Burra Burra,* c, So. Australia	5 0 0	—		70 0 0	0 10 0	Oct. 1872
20000	Cape Copper Mining,*† So. Africa	7 0 0	42	40 42	27 15 0	1 0 0	Mar. 1877
40000	Cedar Creek, g, California*	5 0 0	—		0 5 0	0 2 6	June 1873
15000	Chicago, s, Utah*	10 0 0	4¾	4¼ 4¾	2 8 0	0 4 0	Nov. 1876
21000	Colorado Terrible, s-l, Colorado*†	5 0 0	1¾	1¼ 1¾	0 13 6	0 4 0	Jan. 1875
10000	Copiapo, c, Chili* (£20 shares)	16 15 0	—		7 8 5	0 2 6	Jan. 1876
00000	Don Pedro North del Rey*†	0 16 0	½	¼ ½	2 5 9	0 2 0	Mar. 1872
23500	Eberhardt and Aurora, s, Nevada*†	10 0 0	9	8½ 9	1 8 0	0 3 0	Dec. 1876
50000	Emma,* g, s, Utah	20 0 0	⅝	⅜ ⅝	3 12 0	0 6 0	Dec. 1872
70000	English and Australian, c† S. Aust.	2 10 0	1⅜	1¼ 1½	2 18 9	0 2 0	Mar. 1876
30000	Flagstaff, s, Utah*	10 0 0	3⅝	3⅜ 3⅝	4 2 0	0 5 0	July 1873
25000	Fortuna, l, Spain*†	2 0 0	7	6½ 7	6 9 2	0 6 8	Mar. 1877
55000	Frontino & Bolivia, g, New Gran.*†	2 0 0	1⅝	1⅜ 1⅝	0 1 0	0 1 0	June 1876
30000	Gold Run, hyd.	1 0 0	—		0 2 4	0 0 4	Oct. 1872
68000	Kapunda Mining Co. Australia†	1 3 0	—		0 2 4	0 0 6	June 1873
20000	Last Chance, s,* Utah	5 0 0	¾	½ ¾	0 14 0	0 2 0	July 1873
15000	Linares, l, Spain*†	3 0 0	7¼	6¾ 7¼	16 17 2	0 9 0	Mar. 1877
65000	London and California, g*†	2 0 0	⅜	⅜ ⅜	0 1 0	0 1 0	July 1875
7837	Lusitanian, Portugal*† (£5 shares)	3 10 0	—		1 11 6	0 1 6	Mar. 1873
5000	Mammoth Copperopolis of Utah, c, s	10 0 0	—		0 5 0	0 5 0	Dec. 1872
5000	Mountain Chief, s, Utah*	10 0 0	—		0 4 0	0 4 0	Jan. 1873
18000	Prussian Mining & Ironworks, cl, i.	30 0 0	—		6 0 0	3 0 0	July 1873
10000	Pontgibaud, s-l, France†	20 0 0	25	22 25	23 1 1	1 11 1	Nov. 1876
100000	Port Phillip, g, Clunes*†	1 0 0	¾	½ ⅝	1 8 0	0 1 0	Jan. 1872
54000	Richmond Consols, s, Nevada*†	5 0 0	6⅜	6 6¼	3 9 0	0 7 6	Oct. 1876
40000	Santa Barbara,* g, Brazil	0 10 0	2½	2¼ 2½	0 2 6	0 1 3	Oct. 1876
120000	Scottish Australian Mining Co.*†	1 0 0	2¾	2 2¾	17½ per cent.		Nov. 1876
80000	Scottish Austral. Mining Co., New	0 5 0	⅜	¼ ⅜	17½ per cent.		Nov. 1876
112500	Sierra Buttes, g, California*†	2 0 0	2	1½ 2	1 16 0	0 2 0	Oct. 1876
60000	South Aurora, s, Nevada*	5 0 0	⅜	¼ ⅜	0 14 2	0 2 0	Nov. 1873
£253000	St. John del Rey*† (£5 stock and multiples dealt in)			270 300	½ year	20 p. ct. for Dec.	1876
20000	Tolima, j, s* So. America	5 0 0	3¼	3 3¼	0 11 6	0 6 6	May 1874
25000	Victoria (London)*, g, Australia	1 0 0	1¼	1 1¼	0 11 10½	0 0 10	Aug. 1876
15000	Western Andes, s,* New Granada	5 0 0	—		12 per cent. per an.		July 1876
21000	W. Prussian (5500 pref. sh. 10l. paid)	10 0 0	11¼	11 11¼	0 16 0	0 8 0	Sept. 1876

NON-DIVIDEND FOREIGN MINES.

Shares.	Mines.	Paid.	Last Pr.	Clos. Pr.	Last Call.
20000	Anglo-Australian, g, Victoria*	2 10 0	—		Fully pd.
5000	Anguilla Phosphate, West Indies (4000 issued)	10 0 0	—		Fully pd.
12000	Argentine, g, Argentine Republic	5 0 0	5½	5 5½	Fully pd.
16000	Australian Central, g* (also 6000 deferred shares)	1 0 0	—		Fully pd.
3000	Bellavista, s, Peru* (£10 shares)	10 0 0	—		Fully pd.
30000	Blue Tent, hyd., California	5 0 0	3¼	3 3¼	Fully pd.
35000	Cesena Sulphur Company, Romanga, Italy*	10 0 0	—		Fully pd.
50152	Chontales, g, s, Nicaragua*†	2 0 0	⅜	¼ ⅜	Fully pd.
16000	Condes of Chili, s-l	5 0 0	5¼	4¾ 5¼	Fully pd.
35000	Excelsior Hydraulic Gold Washing Co., California*	6 0 0	—		Dec. 1871
100000	Exchequer, g, s, California*†	1 0 0	1¾	1½ 1¾	Fully pd.
40000	Holcombe Valley, g,* California	1 0 0	—		July 1873
6000	Hornachos,* s-l, (£10 shares) Spain	10 0 0	13¼	13¼ 13¾	Jan. 1874
20000	Imperial Brazilian Collieries, Brazil*	5 0 0	—		Fully pd.
60000	I. X. L., g, s, California*	1 0 0	1	⅞ 1	Fully pd.
50000	Javali, g, Nicaragua*	2 0 0	½	⅜ ½	Fully pd.
3500	La Manche, l, Newfoundland	10 0 0	—		Fully pd.
12000	Lanestosa,* l, z, Viscaya, Spain (£2 shares)	1 15 0	—		Mar. 1876
75000	Malabar, g, Colombia* (67165 issued)	1 0 0	⅞	⅝ ⅞	Fully pd.
40000	Malpaso, g, Colombia* (7400 pref. shares, fully paid)	1 0 0	¾	⅝ ¾	Fully pd.
12000	Menzenberg, c, Honnef, Germany*	5 5 0	—		Fully pd.
4588	New Bensberg, i, l, Germany	5 0 0	par		Nov. 1876
66000	New Quebrada, c, Venezuela*	5 0 0	4½	4 4½	Fully pd.
20000	New Zealand Kapanga, g, Coromandel*	5 0 0	2½	2 2½	Fully pd.
3000	Oregon,* g, Oregon, U.S. (preference shares)	4 0 0	4¼	4 4¼	Sept. 1875
50000	Panulcillo, c, Chili*† (£80000 debentures)	4 0 0	1¾	1¼ 1¾	Fully pd.
80000	Pestarena United, g, Italy*†	3 0 0	¼	⅛ ¼	Fully pd.
50000	Providencia and New Rosario, s, Mexico*	1 0 0	—		Fully pd.
50000	Rica, g, Colombia* (40000 issued)	1 0 0	¼	⅛ ¼	Fully pd.
£2,181,000	Rio Tinto,* c, Huelva, Spain	Stock	66	64 66	Fully pd.
100000	Rossa Grande, g, Brazil*† (£1 shares)	0 19 0	⅛	⅛	July 1872
30000	Russia Copper, Orenburg and Ufa*†	10 0 0	2½	2 2½	Fully pd.
25000	San Pedro, c, Chili*	2 0 0	1	¾ 1	Fully pd.
10000	Silver Plume, s, Colorado*	1 0 0	—		Fully pd.
37500	Snowdrift, s, Colorado*	2 0 0	—		Fully pd.
30000	Tecoma, s, Utah*	10 0 0	⅝	⅜ ½	Fully pd.
20000	Thornhill Reef, g, Australia*	1 0 0	—		Fully pd.
43174	United Mexican, s, Mexico*†‡	28 15 3	2½	2 2½	May 1875
14000	Utah, g, s-l, Utah*	5 0 0	—		Fully pd.
75000	Yorke Peninsula, c, South Australia	1 0 0	½	¼ ½	Fully pd.
40000	Yorke Peninsula, c, South Australia Preference	1 0 0	1⅛	⅞ 1⅛	Fully pd.

§ Have made calls since last dividend was paid.

FOREIGN AND MISCELLANEOUS STOCKS, BONDS, LOANS, AND TRUSTS.

	Closing Prices.	
Argentine, 1868, 6 per cent.	66	68
Bolivia, 6 per cent.	18	20
Brazilian, 1865, 5 per cent.	93	95
Chilian, 1866, 7 per cent.	101	104
City of Providence, 5 p.c. coupon bonds	98	100
Egyptian, 1862, 7 per cent.	51	53
Do., 1868, 7 per cent.	52	53
Do., 7 per cent., V.M.L.	66	68
Do., 9 per cent. guar.	73	77
Do., 7 per cent., K.M.L.	38	40

	Closing Prices.	
Foreign and Col. Gov. Trust, 6 p. cent.	70	75
Do., 5 per cent., 2d issue	55	60
Do., 6 per cent., 3d issue	67	73
Do., 1872, 4th issue	60	65
Do., 1873, 5th issue	59	64
Peruvian, 1870, 6 per cent.	18	19
Do. 1872, 5 per cent.	14	15
Russian, 5½ per cent. L. Mort.	78	81
Spanish, Quicksilver Mort. 5 p. cent.	93	95
United States Mort., 6 per cent.	93½	94½

NON-DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.
40000	Aberdaunant, l, Llanidloes*	1 0 0	1⅝	1⅜ 1⅝
10000	Aberystwith,* s-l, Cardigan	5 0 0	—	
7800	Alvig. & Burng.,*t, St. Aust. (3l. sh.)	2 10 0	2¾	2⅝ 2¾
18000	Ambrose Lake, t, c, Liskeard	1 18 6	—	
12000	Assheton, l, Carnarvonshire*	5 0 0	2	1¾ 2
50000	Ballycummisk,* c, Schull	2 0 0		
12000	Bedford United, c, Tavistock	1 19 6	⅞	½ ¾
28000	Belstone,* c, Devon (27,000 fy. pd.)	1 0 0	2¾	2¼ 2¾
15000	Blaen United,* s-l, Cardigan	1 0 0	1⅛	⅞ 1⅛
3937	Blue Hills, t, c, St. Agnes	3 7 6	—	
30000	Bodidris,* l, bl, Denbighshire	1 0 0	1¼	1⅛ 1¼
2000	Bowden Hill,* mn	1 0 0	—	
6000	Bradwell Moss Rake	1 0 0	1⅛	⅞ 1⅛
30000	Caldbeck Fells, l, Cumberland*	3 0 0	—	
15000	Cathedral, t, c, Gwennap*	1 10 0	1¼	1 1¼
20000	Central Foxdale, l, I. of Man* (2l. sh.)	1 0 0	—	
10000	Central Van,* l, bl, Llanidloes	5 0 0	—	
128	Clementina, l, Llanrwst	20 0 0	45	35 45
7500	Combellack,* t, Wendron	2 0 0	2¼	2 2¼
6000	Combmartin, s-l, North Devon	5 0 0	⅝	½ ⅝
24000	Court Grange, s-l., Cardiganshire	0 15 0	1⅛	1 1⅛
20000	Cwm Dwyfor,* c, s-l, Carnarvonsh.	0 15 0	—	
3000	Cwmystwith (New) [5l. shares]	4 0 0	—	
512	D'Eresby Mountain, l, bl, Llanrwst	20 0 0	30	20 25
10000	Denbighshire Consolidated, l*	3 0 0	3	2½ 3
12000	Derwent,* l, Durham	4 0 0	4	3½ 4
656	Ding Dong, t, Gulval	51 9 6	4	3½ 4
10000	Dubby Syke, l, Durham*	0 12 6	½	⅜ ½
4000	East Chiverton, l, Perranzabuloe	6 14 6	2½	2 2½
6000	East Goginan, l, Cardigan	2 0 0	2	2
18000	East Van, l, Llanidloes*	5 0 0	7¾	7 7½
20000	Elgar,* s-l, Cardiganshire	1 0 0	1¼	1 1¼
5000	Frank Mills, l, Christow	5 6 0	⅝	½ ⅝
8000	Fronvellan, l, Mont.* [4000 sh. fy. pd.]	1 0 0	—	
3950	Gawton, c, Tavistock	4 3 6	⅝	⅜ ⅝
12000	Glan Clwyd,* l, Gwyddelwern	1 0 0	—	
14000	Glenroy,* s-l, Isle of Man	4 0 0	1⅝	1⅜ 1⅝
10000	Glyn,* l, Llanidloes	2 0 0	2	1¾ 2
12000	Goginan, & Level Newydd, Card., l	2 10 0	—	
100000	Gold, g, Merionethshire	1 0 0	—	
20000	Goreu,* s-l, Carmarthen	1 0 0	1¼	1⅛ 1¼
7500	Gorsedd and Merllyn Cons., l, Flint	2 10 0	5½	4½ 5
20000	Gt. E. Foxdale, l, I. of Man (1l. sh)	0 15 0	—	
9500	Great Pant-y-Pydew, l, Holywell	2 0 0	—	
6000	Gt. Wheal Eleanor, t, North Bovey	1 0 0	3	2 3
18000	Grosvenor, l, Holywell (£1 sh.)	0 15 0	—	
10000	Harehope Gill,* l, Durham (£1 sh.)	0 5 0	1	¾ 1
6400	Harwood,* l, Durham	0 15 0	1	¾ 1
5000	Hush Eisteddfod Minera,* l	2 0 0	—	
200	Islay,* l, Scotland	28 0 0	—	
6000	Killifreth, t, Chacewater	1 18 0	1⅛	1 1⅛
25000	Kingston Con., s-l, Stoke Climsland	1 0 0	—	
12000	Ladywell,* l, Salop	2 10 0	1¼	1 1¼
12000	Ditto, 10 per cent. pref., 1l. each	0 5 0	⅜	¼ ⅜
20000	Leadhills,* l, Lanarkshire	6 0 0	6¾	6 6½
2500	Levant, c, t, St. Just	9 6 6	—	
25000	Llanrhaiadr, l, Montgomery*	2 0 0	—	
30000	Llanrwst,* l, Carnarvon	2 0 0	3¾	3½ 3¾
15000	Llwyn Teify,* s-l, Cardigan	1 0 0	—	
6000	Medlyn Moor, t, Wendron	1 17 4	2	2
10000	Mellanear Copper, Hayle*	1 0 0	—	
11000	Monydd Gorddu, l, Cardigan* (Red.)	5 0 0	5¼	5 5¼
12000	Mount's Bay, c, Marazion	1 0 0	—	
25000	Nant-y-Ronen, s-l, Cardigan*	1 0 0	—	
15000	Nascent Copper*	1 0 0	—	
12000	Neptune,* c, Perranuthnoe	0 5 0	—	
3000	New Chiverton,* l, Perranzabuloe	6 0 0	6½	6¼ 6½
20000	New Consols, s,a, Stoke Climsland*	3 0 0	1¼	1 1¼
8000	New Dolcoath, t, c, Camborne*	3 0 0	1¾	1½ 1¾
20000	New East Foxdale, s-l, Isle of Man	0 15 0	—	
16000	New Fowey Consols, t, St. Blazey*	3 0 0	2	1¾ 2
1492	New Hendra, t, Breage	2 19 0	1⅛	1 1⅛
10000	New North Pool,* c, Illogan	3 0 0	2	1½ 2
5000	New St. Agnes,* t, St. Agnes	5 0 0	5¼	5 5¼
3200	New South Merllyn, l, Flint*	2 10 0	2	1½ 2
4000	North Cornwall, l, Cornwall	5 0 0	5¼	5 5¼
17000	North Laxey,* Isle of Man	2 0 0	⅞	¾ ⅞
20000	North Prince Patrick,* l, Holywell	1 0 0	1¼	1 1¼
5936	North Treskerby, c, St. Agnes	3 17 10	—	
2000	North Wheal Towan, t, c, Illogan	1 19 6	—	
6000	Old Talargoch, l, Flintshire*	2 0 0	—	
2500	Old Tincroft, c, t, Lelant*	4 0 0	4	3 4
6400	Oola Hills,* s-l, Limerick	5 0 0	—	
12000	Pandora,* l, Carnarvon	2 0 0	2½	2 2½
16923	Parys Mountain,* c, Anglesea	3 0 0	½	⅜ ½
4000	Pateley Bridge, l, Yorkshire	5 0 0	3	2¼ 2½
6000	Pedn-an-drea Consols, t, Redruth	5 0 0	7	6¾ 7
6000	Pennant, l, bar, North Wales*	5 0 0	6	5½ 6
12000	Pennerley, l, Shropshire*	2 0 0	⅞	¾ ⅞
30000	Perkins Beach, l, Shropshire	1 0 0	1	1 1¼
12000	Plynlimmon, l, Llanidloes*	2 0 0	⅜	¼ ⅜
648	Polrose, t, Breage	21 0 0	—	
10000	Port Nigel,* s-l, Carnarvonshire	2 0 0	2½	2 2½
2000	Prideaux Wood, t, Llanivery	5 0 0	—	
12800	Prince of Wales, c, Calstock‡	1 19 6	¾	½ ¾
10000	Red Rock,* l, Cardigan	2 0 0	2¾	2¼ 2¾
6000	Relistian Consols, c, Gwinear	0 10 0	⅝	½ ⅝
15000	Rookhope l, Durham*	1 10 0	⅞	¾ ⅞
3000	Russell, s-l, Swymbridge	0 5 0	—	
5000	Silvercross,* c, t, Marazion	1 0 0	¾	½ ¾
4200	Snowbrook, s-l, Montgomery	5 0 0	5¾	5½ 5¾
5000	South Carn Brea, c, t, Illogan	3 10 0	¾	½ ¾
6000	So. Cwmystwith, l, Cardiganshire	2 0 0	4	3½ 4
6000	South Darren, l, Cardigan*	1 10 0	—	
512	South Dolcoath, c, t, Redruth	12 5 0	1⅛	1 1¼
18000	South Roman Gravels, l*	1 10 0	1	⅜ ⅝
6000	South Roskear, t, c, Camborne	6 10 0	5	4 5
6000	South Tolcarne, t, c, Camborne	1 9 0	¾	½ ¾
937	South Wheal Crofty, c, Illogan	36 10 10	16	14 16
4500	South Wh. Frances, c, Illogan†	7 4 4	1¼	¾ 1¼
432	Spearn Moor, t, Penzance‡	46 17 9	—	
6000	St. Lawrence, Amal., l, Flintshire*	2 0 0	—	
10000	St. Patrick, l, Halkin, Holywell*	1 0 0	1½	1¼ 1½
6000	Success, &c., l, Derb. (12,000l. called)	1 0 0	—	
16000	Sunnyside,* l, Durham	2 0 0	2½	2 2½
30000	Talybont,* s-l, Talybont	1 0 0	2¼	2 2¼
6400	Teesdale,* l, Durham	1 0 0	1	1
14000	Teign Valley, l, bar., Bridford	1 0 0	—	
10000	Temple, l, Cardigan*	1 0 0	2½	2 2½
12000	Trebeigh Consols, s-l, St. Ive	0 7 6	½	⅜ ½
5000	Treleigh Wood, t, Redruth	5 16 0	—	
547	Trelyon Consols	15 0 0	⅝	½ ⅝
12000	Trethellan, s-l, Crantock*	2 0 0	—	
2563	Trumpet Consols, t, Helston§	10 0 0	—	
640	Truro*, l, Nerquis, Flintshire	10 0 0	10	10
25000	Unity Wood, t, c, Kenwyn	4 5 6	⅝	½ ⅝
20000	Van Consols, l, Llanidloes*	2 10 0	3	2½ 2¾
12000	West Assheton, l, Carnarvon	1 0 0	1¼	¾ 1¼
6000	West Basset, c, Illogan†‡	5 6 8	4	3½ 4
20000	West Bryn Celyn,* l, Flintshire	1 0 0	—	
5500	West Combmartin, s-l, North Devon	1 0 0	1¼	1¼ 1⅜
7000	Ditto	0 2 6	½	⅜ ½
3000	W. Craven Moor, l, Pateley Bridge*	10 0 0	13½	12½ 13½
5000	West Godolphin, t, c, Breage	1 16 0	3	2½ 3
12000	West Goginan,* Cardiganshire	2 0 0	¾	½ ¾
15000	West Great Work, t, Breage*	2 0 0	3¼	2½ 2¾
10000	West Llangynog, s-l, Montgomery	2 0 0	—	
12000	W. Maria & Fortescue, t, c, Lamer.	4 14 0	⅜	¼ ⅜
3000	West Mary Ann, l, Menheniot	0 3 6	¾	⅝ ¾
50000	West Milwr, s-l, Flint	1 0 0	—	
20000	West Pateley Bridge, l, Yorkshire	1 0 0	1¼	1 1¼
10000	West Roskear, t, s-l, bl, c, Camborne	0 12 0	3	2½ 3
15000	W. Tankerv*, l. (in 3000s .15p.c.pref.)	3 0 0	1¾	1⅜ 1⅝
15000	West Treravean,* c, t, Gwennap	1 0 0	1⅜	1¼ 1⅜
3000	West Wheal Peevor, t, Redruth	0 10 0	2¾	2½ 2¾
600	West Wheal Seton, c, Camborne†	47 0 0	30	30 35
6000	Wheal Agar, c, Illogan	11 10 0	3¾	3½ 3¾
6000	Wheal Argus, t, Sancreed	0 10 0	—	
741	Wheal Basset and Grylls, t	9 18 6	—	
6000	Wheal Coates, t, St. Agnes	2 0 0	2	1½ 2
6000	Wheal Crebor, c, Tavistock	4 1 0	3	2½ 3
8400	Wheal Emma, t, c, Buckfastleigh	1 10 0	—	
50	Wheal Fowey and East Eliza, t	100 0 0	110	100 110
5179	Wheal Grenville, c, Camborne*	2 8 6	1	1 1¼
12000	Wh. Mary Hutchings,* t, Plympton	1 14 0	—	
25000	Wheal Newton, a,c,s,t, Callington*	1 0 0	2¼	2 2¼
3000	Wheal Peevor, t, Redruth	6 7 6	4¾	4½ 4¾
12000	Wheal Russell, c, Tavistock	2 0 6	⅜	¼ ⅜
4096	Wheal Uny, t, c, Redruth	13 6 6	2	1¾ 2
480	White Cliff,* l, Llanrwst	4 0 0	4	4

b, blende cl, coal; c, copper; g, gold; l, lead; s, silver; sl, slate; s-l, silver-lead; t, tin; z, zinc.

* Limited Liability Companies; † quoted on the Stock Exchange; ‡ have paid dividends.

IRON AND COAL COMPANIES.

Shares.	Company.	Paid.	Prices.	
£100	Abbot, John, and Co. [L.]	£75 0 0	1¼	1
15	Albion Steel and Wire Co. [L.]	14 0 0	15	14½
5	Alltami Colliery Co. [L.]	5 0 0	par	½
100	Ashbury Co. [L.]	90 0 0	40	35
10	Bagnall, John, and Sons [L.]	10 0 0	6	5½
10	Benhar Coal Co. [L.]	10 0 0	½ dis.	
50	Bilbao Iron Ore Co. [L.]	50 0 0	23½	24½
10	Bilson & Crump Meadow Coll. Co. [L.]	10 0 0		—
4	Blaen Cwmbach Coal Co. [L.]	4 0 0		—
50	Blaenavon Iron and Steel Co. [L.]	50 0 0		—
100	Bolckow, Vaughan, and Co. [L.]...A	45 0 0	7	8
50	Bowling Iron Co. [L.]	50 0 0		—
50	Britannia Ironworks [L.]	25 0 0		—
50	Brown, Bailey, and Dixon [L.]	40 0 0	18½	18¾
100	Brown, John, and Co. [L.]	70 0 0	½ dis.	½
5	Cakemore Colliery Co. [L.]	5 0 0		—
100	Cammell and Co. [L.]	80 0 0	3	3½
20	Cannock and Huntington Coal [L.]	2 0 0		—
10	Cardiff & Swansea St. Coal Co. [L.]	8 0 0		—
10	Cardigan Steel and Wire Co. [L.]	8 10 0		—
10	Central Swedish Iron and Steel [L.]	10 0 0	1	1
5	Chapel House Colliery	5 0 0	2¾	3
50	Charlton Iron Co. [L.]	50 0 0	13	14
50	Chatterley Iron Co. [L.]	45 0 0	24	23
10	Chillington Iron Co. [L.]	10 0 0	6½	6½
1	Clee Hill Colliery Co. [L.]	1 0 0		—
10	Consett Iron Co. [L.]	7 10 0	10½	11
1	Consett Spanish Ore [L.]	1 0 0	½ dis.	
50	Cooke, William, and Co. [L.]	40 0 0	33	33
20	Darlington Iron Co. [L.]	10 0 0	9½	9½
50	Davy Brothers [L.]	22 10 0	9½	9½
5	Diamond Fuel Co. [L.]	5 0 0	½	1½
32	Ebbw Vale Co. [L.]	29 0 0	21	19
100	Fox, Samuel, and Co. [L.]	80 0 0	35	37
10	General Mining Ass. [L.] (£1 returned)	9 0 0	3½	4½
20	Great Western Coal Co. [L.]	17 0 0		—
2	Gwyngwillim Colliery Co. [L.]	2 0 0		—
15	Hopkins, Gilkes, and Co. [L.]	11 0 0	7½	6½
50	Knowles, Andrew, and Sons [L.]	17 0 0	½	1
10	Llay Hall Coal, Iron, & Firebrick [L.]	10 0 0	10	10½
5	Littledean Woodside Coll. Co. [L.]	5 0 0		—
50	Llynvi, Ogmore, & Tondu Co. [L.]	50 0 0	35	33
10	Lydney and Wigpool Iron Ore [L.]	8 5 0	10	9
10	Marbella Iron Ore Co. [L.]	10 0 0	7¼	6½
6	Mersey Steel and Iron Co. [L.]	5 0 0	10	9
10	Midland Iron Co. [L.]	5 0 0	½	1½
5	Mold Argoed Colliery Co. [L.]	5 0 0		—
10	Monkland Iron and Coal Co. [L.]	10 0 0	7½	7
4	Mwyndy Iron Ore [L.]	3 10 0	2	1½
100	Nant-y-Glo and Blaina (8 p.c. pref.)	100 0 0	20	21
1	Nerbudda Coal and Iron	0 8 0	½ dis.	
20	New Sharlston Collieries [L.] Pref.	20 0 0	16	15
10	Newport Abercarn Coal Co. [L.]	10 0 0	6¼	6
10	Northmptn. Coal, Iron & Wagon [L.]	8 0 0		—
10	Northfield Iron Co. [L.]	8 0 0	2⅜	3
1	Norton Green Coal Co. [L.]	1 0 0		—
35	Palmer's Shipbuilding and Iron [L.]	25 0 0	16	15½
100	Parkgate Iron Co. [L.]	65 0 0	3 dis.	
20	Patent Nut and Bolt Co. [L.]	14 0 0	7	7½
20	Patent Shaft and Axletree [L.]	10 0 0		—
20	Pelsall Coal and Iron [L.]	15 0 0	9	7
50	Phœnix Bessemer Co. [L.]	40 0 0		—
50	Rhymney Iron Co. [L.]	50 0 0	21	21
10	Richards and Co. [L.]	10 0 0	7	8
100	Sandwell Park Colliery Co. [L.]	100 0 0		—
50	Ditto New	10 0 0		—
100	Shotts Iron Co. [L.]	100 0 0	par	1
100	Sheepbridge Iron and Coal [L.]	55 0 0	5½	5¾
50	Silkstone & Dodworth Cl. & Iron [L.]	27 0 0	10	9
20	Skerne Ironworks [L.]	20 0 0	13½	13
50	Somorrostro Iron Co. [L.]	50 0 0	10	11
20	South Wales Coal Co. [L.]	17 0 0		—
100	Staveley Iron and Coal Co. [L.]	60 0 0	30	31
100	Ditto ditto New	10 0 0	5	5½
20	South Cleveland Ironworks [L.]	20 0 0		—
10	Swansea Valley Steam Coll. Co. [L.]	6 0 0		
100	Thames Iron Company	100 0 0		—
50	Tredegar Iron and Coal Co. [L.]	12 0 0	5	3
25	Ditto B. shares	25 0 0	2	1
20	Ulverston Mining Co. [L.]	12 0 0	1¾	1¾
1	United Bituminous Collieries [L.]	1 0 0		—
10	Vancouver Coal [L.]	6 0 0	par	½
100	Vickers, Sons, & Co. [L.]	100 0 0	35	45
50	Welsh Ironworks Co. [L.]	50 0 0		—
25	W. Cumberland I. and Steel [L.]	20 0 0	10	9
10	West Mostyn Coal [L.] (12 p.c. pref.)	5 0 0		—
5	West Swansea Colliery Co. [L.]	5 0 0		—
10	Whitehaven Iron Co. [L.]	10 0 0		—
100	Wigan and Whiston Coal Co. [L.]	70 0 0		—
100	Wigan Coal and Iron Co. [L.]	75 0 0		—

WAGON COMPANIES.

10	Birmingham Wagon Co. [L.]	10 0 0	22	22½
10	Ditto, 2nd issue	4 0 0	4	4½ pm
10	Ditto, pref., 6 per cent.	10 0 0	12¼	12¾
20	British Wagon Co. [L.]	10 0 0	2¾	3 pm
10	Gloucester [L.]	10 0 0	12¼	12¾
10	Ditto, 5th issue	5 0 0	1¾	1⅞ pm
10	Met. Rail. Car. and Wagon Co. [L.]	5 0 0	4½	4¾ pm
5	Ditto, pref., 6 per cent.	5 0 0	5½	5¾
50	Midland	50 0 0	95½	97½
20	North Central Wagon Co.	20 0 0	27¾	28
5	Rail. Car. [L.] (Oldbury)	5 0 0	10⅜	10⅝
5	Ditto, pref., 6 per cent.	5 0 0	6	6½
20	Sheffield Wagon Co. [L.]	15 0 0	3½	3¾ pm
10	Yorkshire Wagon Co. [L.]	10 0 0	4½	5 pm

TELEGRAPH COMPANIES.

"St."	Anglo-American	100 0 0	59	59½
10	Brazilian Submarine	10 0 0	6⅜	6⅝
20	Direct United States Cable	20 0 0	12	12½
10	Eastern	10 0 0	7	7½
10	East. Exten., Australia and China	10 0 0	7	7½
10	Great Northern	10 0 0	7¼	7½
25	Indo-European	25 0 0	20	21
10	Mediterranean Extension	10 0 0	2½	3
8	Reuters	8 0 0	12	13
Stk.	Submarine	100 0 0	225	235
10	West India and Panama	10 0 0	3	3½
20	Western and Brazilian	20 0 0	4½	5½
$1000	Western Union, 7 per cent. Mort. Bonds	$1000	109	111

MISCELLANEOUS.

Stk.	Atlantic and Great Western Leased Lines, Rental Trust	100 0 0	38	42
25	Austral. Mort. Land and Finance [L.]	5 0 0	4	4½ pm
25	Australian Agricultural	21 10 0	94	96
10	Avonside Engine [L.]	7 0 0	4	3
Stk.	Baltimore and Ohio, 6 per cent.	100 0 0	109	110
Stk.	Cent. of New Jersey Con. Mort.	100 0 0	51	53
Stk.	Cent. Pacific of Calif., 1st Mort. 6 p.c.	100 0 0	103½	104½
25	City of London Real Property [L.]	12 0 0	¾	1¼ pm
25	Copper Miners of Eng. (7 p. c. pref.)	25 0 0		—
5	Credit Foncier of England [L.]	5 0 0	1⅜	1⅝
5	Diamond Rock Boring	4 10 0	1½	1
15	English and Foreign Credit	8 0 0		—
16	Fore Street Warehouse [L.]	14 0 0	14½	15½ pm
15	Foster, Porter, and Co. [L.]	10 10 0	11	12 pm
5	Gen. Phos. & Chem. Works Co. [L.]	5 0 0		—
1	Glaisdale Whinstone Quarry	1 0 0		—
17	Hudson's Bay Company	17 0 0	13½	14
10	Huntington Copper and Sul. Co.	9 0 0	8¼	7¾
Stk.	Illinois Central, $100 shares	100 0 0	45	47
Stk.	Illinois & St. Louis Bridge, 1st Mort.	100 0 0	96	98
Stk.	Ditto, 2nd Mort., 7 per cent.	100 0 0	58	62
Stk.	Illinois Cent. Sinking Fund, 5 p. cent.	100 0 0	89	91
Stk.	Ditto, 6 per cent.	100 0 0	101	103
7½	Imperial Credit [L.]	7 10 0	7¼	7¾
—	Ditto, Surplus Certificate	—	5¼	5¾
Stk.	Lehigh Val. Con. Mort., A, 6. p. cent.	100 0 0	96	98
10	Milner's Safe [L.]	10 0 0	9½	10
25	National Discount [L.]	5 0 0	10	10½
Stk.	N. Cent. Rail. Con. Mort., 6 per cent.	10 0 0	84	86
5	Patent Gunpowder Company	0 0	4½	4
10	Pawson and Co. [L.]	0 0	½ dis.	½ pm
50	Peninsular and Oriental Steam	50 0 0	38	40
Stk.	Pennsyl. Gen. Mort. 6 p. cent., 1910	100 0 0	103½	104½
Stk.	Ditto, Con. Sink. Fund, 6 p. ct., 1905	100 0 0	93½	94½
Stk.	Scottish Aust. Investment Company	100 0 0	180	190
Stk.	Ditto, 6 per cent. Preference	100 0 0	121	123
10	Silber Light (ord. sh.)	10 0 0		—
20	Suez Canal shares	20 0 0		—
12	Telegraph Construc. & Mainte. [L.]	12 0 0	26½	27½
5	Ditto, Second Bonus Three per Cents	5 0 0	2⅜	3⅜
10	Tharsis Sulphur and Copper Co.	10 0 0	20	22
Stk.	Union Pacific Land Grant, 1st Mort.	100 0 0	97	99
Stk.	Union Pacific Railway, 1st Mort.	100 0 0	101	103

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